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A N A T O M Y.

INTRODUCTION.

Sect. I. Etymology, Definition, *and* Divisions *of* Anatomy.

(1.) ANATOMY, [*anatomiæ*, Fr. *anatomia*, Lat. from Ανατεμω, of ανατεμνω, Gr. to cut asunder,] literally signifies diſſection or ſeparation of parts. As an ART, therefore, anatomy means ſimply the operation of diſſecting or artificially ſeparating the parts of an animal body; but as a SCIENCE, it comprehends all the objects of ſuch diſſection; which, in general, are, to diſcover the various ſituations, figures, connections, powers and uſes of the parts, with the ſtructure, fabric, and œconomy of the whole.

(2.) This moſt important ſcience is uſually divided into ANATOMY properly ſo called, or as ſome authors juſtly ſtile it HUMAN ANATOMY, and COMPARATIVE ANATOMY. The former of theſe is uſually applied to the examination of the ſtructure and parts of the human body: the latter to that of the brute creation alone.

(3.) ANATOMY has alſo been divided into SPECULATIVE and PRACTICAL, a diviſion of little moment; as well as into PHYSICAL, comprehending that which has for its object the deſcription of the ſeveral parts, and MEDICINAL, meaning that which, along with the former, comprehends alſo their offices, uſes, and concern in preſerving health, or being ſubject to diſeaſe.

Sect. II. History *of* Anatomy.

(4.) This ſcience is generally believed to be very ancient; although many ages have paſſed before it was brought to any degree of perfection. It is natural to think, indeed, that there muſt have been ſome knowledge of it very early in the world, as the ſlaughter of beaſts for the uſe of men, as well as for ſacrifices; the accidents of war, and attention to the recovery of the wounded; the various methods of putting criminals to death; murders, and the numerous caſualties to which the human body is ſubject, &c. together with the curioſity natural to mankind in all ages, could not fail to furniſh ſome general knowledge of the ſtructure of the human body at a very early period. But it is extremely difficult, if not impoſſible, to fix the period, when anatomy firſt began to be ſtudied as a ſcience.

(5.) MANETHO, an ancient Egyptian author, according to the report of Euſebius, relates that ATHOTIS, a king of Egypt, wrote ſome treatiſes on anatomy. This king, according to the romantic chronology of the Egyptians, lived many ages before Adam. But although we reject the anachroniſm as falſe, we may admit the poſſibility of the fact, that the Egyptian monarch had made ſome advances in the ſtudy of anatomy; and conſequently, that the ſcience had begun early to attract the attention even of royalty. It has alſo been inferred from ſome paſſages in Eccleſiaſtes, that SOLOMON was not ignorant of the ſtructure of the human body.

(6.) Be that as it may, it is certain, that the ſtudy of anatomy had made ſome progreſs in Greece before the days of Homer; as that poet appears, from various paſſages in his celebrated poems, to have had a tolerable knowledge of different parts of the human body; and to have been well verſed in the *enunciation* (as the moderns expreſs it) *of wounds*; as he gives a pretty accurate account of their effects in almoſt all parts of the body.

(7.) What diſcoveries in the animal œconomy were made by ÆSCULAPIUS, who flouriſhed long before Homer, neither hiſtory nor tradition records. But it is at leaſt highly probable, from the great fame he had acquired as a phyſician during his life, and which led the ſuperſtitious Greeks to deify and worſhip him, as the god of phyſic after his death, that he had made ſome tolerable proficiency in anatomy, as well as in the other branches of the healing art. Theſe acquiſitions he would naturally communicate to his ſons MACHAON and PODALIRIUS, who we are told, ſucceeded him, and followed his footſteps in the medical profeſſion. From them his diſcoveries would be communicated to others, and no doubt freſh diſcoveries made in the art, till the days of Homer, when it had arrived at that ſtate of improvement, in which we find it ſtood, from the paſſages above alluded to.

(8.) Still, however, neither anatomy nor medicine had attained to ſuch a degree of improve-

ment as to entitle them to be claſſed as Sciences; for till the age of Hippocrates, we find phyſic in general only ranked as a branch of philoſophy among the Greeks. In the other eaſtern countries the climate, as well as their peculiar cuſtoms and ſuperſtitions, appear to have been as unfavourable to practical anatomy as they were inviting to the ſtudy of aſtronomy, geometry, poetry and the other arts of peace. Animal bodies in theſe countries run ſo quickly into nauſeous putrefaction, that the early inhabitants muſt have avoided ſuch offenſive employments as anatomical inquiries, like their poſterity at this day.

(9.) In fact it does not appear by the writings of the Grecians, Jews, or Phœnicians, or of other eaſtern countries, that anatomy was particularly cultivated by any of thoſe eaſtern nations. In tracing it backwards to its infancy, we cannot go farther into antiquity than the times of the Grecian philoſophers. As an art in a ſtate of ſome cultivation, it may be ſaid to have been brought forth and bred up among them as a branch of natural knowledge. The æra of philoſophy, as it was called, began with Thales the Mileſian, about A. A. C. 480. The philoſophers of his ſchool, which was called the Ionian, cultivated principally natural knowledge.

(10.) Socrates, the 7th in ſucceſſion of their great teachers, introduced the ſtudy of morals, and was thence ſaid to bring down philoſophy from heaven, to make men truly wiſe and happy. In the writings of his ſcholar and ſucceſſor Plato, we find that the philoſophers had carefully conſidered the human body, both in its organization and functions; and though they had not arrived at the knowledge of the more minute and intricate parts, which required the ſucceſſive labour and attention of many ages, they had acquired very comprehenſive ideas of the ſubject in general.

(11.) The anatomical deſcriptions of Xenophon and Plato have been quoted by Longinus (§ xxxii.) as ſpecimens of ſublime writing; and the extract from PLATO is ſtill more remarkable, for its containing the rudiments of the circulation of the blood. "The heart, (ſays Plato,) is the centre or knot of the blood-veſſels; the ſpring or fountain of the blood, which is carried impetuouſly round; the blood is the *pabulum* or food of the fleſh; and for the purpoſe of nouriſhment, the body is laid out into canals, like thoſe which are drawn through gardens, that the blood may be conveyed, as from a fountain, to every part of the pervious body."

(12.) The famous HIPPOCRATES was nearly contemporary with theſe eminent philoſophers, about A. A. C. 400. He is ſaid to have ſeparated the profeſſion of philoſophy and phyſic, and to have been the firſt who applied to phyſic alone as the buſineſs of his life. He is likewiſe generally believed to be the firſt who wrote upon anatomy; and the firſt anatomical diſſection which has been recorded, was made by his friend DEMOCRITUS of Abdera. If, however, we read the works of Hippocrates with impartiality, and apply his account of the parts to what we know of the human body, we muſt allow his deſcriptions to be imperfect, incorrect, ſometimes extravagant, and often unintelligible, that of the bones only excepted. He ſeems to have ſtudied theſe with more ſucceſs than the other parts, and tells us that he had an opportunity of ſeeing a human ſkeleton. Pauſanias relates, that Hippocrates, to perpetuate the memory of his diſcoveries in anatomy, conſecrated a brazen ſkeleton to the Delphian Apollo.

(13.) During the period that elapſed between Hippocrates and GALEN, who flouriſhed towards the end of the ſecond century, in the decline of the Roman empire, that is, in the ſpace of 600 years, anatomy was greatly improved; the philoſophers ſtill conſidering it as a moſt curious and intereſting branch of natural knowledge, and the phyſicians as a principal foundation of their art. Both of them, in that interval of time, contributed daily to the common ſtock, by more accurate and extended obſervations, and by the lights of improving philoſophy. As both Hippocrates and Galen had applied very particularly to the ſtudy of animal bodies, they not only made great improvements, eſpecially in phyſiology, but raiſed the credit of natural knowledge, and ſpread it as wide as Alexander's empire.

(14.) From an illiberal idea entertained by ARISTOTLE, few of that philoſopher's writings were made public in his lifetime. He affected to ſay that they would be unintelligible to thoſe who had not heard them explained at his lectures. And, except the uſe which THEOPHRASTUS made of them, they were loſt to the public for above 130 years after the death of Theophraſtus, and at laſt came out defective from bad preſervation, and corrupted by men, who, without proper qualifications, preſumed to correct and to ſupply what was loſt. From the time of Theophraſtus, the ſtudy of natural knowledge at Athens was on the decline; and the reputation of the Lyceum and Academy was almoſt confined to the ſtudies which are ſubſervient to oratory.

(15.) Alexandria in Egypt was the ſcene of the other great inſtitution for Grecian education. The firſt Ptolemies, both from their love of literature, and to give true and permanent dignity to their empire, and to Alexander's favourite city, ſet up a grand ſchool in the palace itſelf, with a muſeum and a library, which, we may ſay, has been the moſt famed in the world. Anatomy, among other ſciences, was publicly taught; and the two diſtinguiſhed anatomiſts were ERASISTRATUS the pupil and friend of Theophraſtus, and HEROPHILUS. Their voluminous works were all loſt, by the burning of that famous library; but theſe are quoted by Galen almoſt in every page. Theſe profeſſors were probably the firſt who were authoriſed to diſſect human bodies; a peculiarity which marks ſtrongly the philoſophical magnanimity of the firſt Ptolemy, and fixes a great æra in the hiſtory of anatomy. And it was no doubt, from this particular advantage which the Alexandrians had above all others, that their ſchool not only gained, but for many centuries preſerved, the firſt reputation for medical education. Ammianus Marcellinus, who lived about 650 years after the ſchools were ſet up, ſays, they were ſo famous in his time, that it was enough to ſecure credit to any phyſician, if he could ſay he had ſtudied at Alexandria. Herophilus has been ſaid to have anatomized 700 bodies. The num-

ber

ber is doubtleſs exaggerated. Nay, it was ſaid, that both he and Eraſiſtratus made it a common practice to open living bodies, that they might diſcover the more ſecret ſprings of life. But this, no doubt, was only a vulgar opinion, riſing from the prejudices of mankind; and accordingly, without any good reaſon, ſuch tales have been told of modern anatomiſts, and have been believed by the vulgar.

(16.) Though it is probable the Romans had phyſicians and ſurgeons from the foundation of the city, yet we have no account of any of theſe applying themſelves to anatomy for a very long time. Archagathus was the firſt Greek phyſician eſtabliſhed in Rome, and he was baniſhed on account of the ſeverity of his operations.—ASCLEPIADES, who flouriſhed in Rome, 101 years after ARCHAGATHUS, in the time of Pompey, attained ſuch a high reputation as to be ranked in the ſame claſs with Hippocrates. He ſeemed to have had ſome notion of the air in reſpiration acting by its weight: and in accounting for digeſtion, he ſuppoſed the food to be no farther changed, than by a comminution into extremely ſmall parts, which, being diſtributed to the ſeveral parts of the body, is aſſimilated to the nature of each. CASSIUS, commonly thought to be a diſciple of Aſclepiades, accounted for the right ſide of the body becoming paralytic on hurting the left ſide of the brain, in the ſame manner as has been done by the moderns, viz. from the croſſing of the nerves from the right to the left ſide of the brain. From the time of Aſclepiades to the ſecond century, phyſicians ſeem to have been greatly encouraged at Rome; and in the writings of CELSUS, RUFUS, PLINY, COELIUS AURELIANUS, and ARETÆUS, we find ſeveral anatomical obſervations, but moſtly very ſuperficial and inaccurate.

(17.) The celebrated GALEN, whoſe name is ſo well known in the medical world, flouriſhed about the end of the 2d century. He applied himſelf particularly to the ſtudy of anatomy, and did more in that branch than all that had gone before him. He ſeems, however, to have been at a great loſs for human ſubjects to operate upon; and therefore his deſcriptions of the parts are moſtly taken from brutes. His works contain the fulleſt hiſtory of anatomiſts, and the moſt complete ſyſtem of the ſcience, to be met with any where before him, or for ſeveral centuries after; ſo that a number of paſſages in them were reckoned abſolutely unintelligible for many ages, until explained by the diſcoveries of ſucceeding anatomiſts.

(18.) Towards the end of the 4th century, NEMESIUS, biſhop of Emeſſa, wrote a treatiſe on the nature of man, in which it is ſaid were contained two celebrated modern diſcoveries; the one, the uſes of the bile, boaſted of by Sylvius de la Boe; and the other the circulation of the blood. This laſt, however, is proved by Dr Friend, in his Hiſtory of Phyſic, p. 289, to be falſely aſcribed to this author.

(19.) When the Roman empire began to be oppreſſed by the barbarians, and ſunk in groſs ſuperſtition, learning of all kinds decreaſed; and when the empire was totally overwhelmed by thoſe barbarous nations, every appearance of ſcience was almoſt extinguiſhed in Europe. The only remains of it were among the Arabians in Spain and in Aſia.—The Saracens, who came into Spain, deſtroyed at firſt all the Greek books which the Vandals had ſpared: But though their government was in a conſtant ſtruggle and fluctuation during 800 years before they were driven out, they received a taſte for learning from their countrymen of the eaſt; ſeveral of their princes encouraged liberal ſtudies: public ſchools were ſet up at Cordova, Toledo, and other towns, and tranſlations of the Greeks into the Arabic language were univerſally taught and read. Thus was the learning of the Grecians transferred to the Arabians. But though they had ſo good a foundation to build upon, this art was never improved while they were maſters of the world: For they were ſatisfied with commenting upon Galen; and ſeem to have made no diſſections of human bodies.

(20.) About the end of the 12th, and beginning of the 13th century, flouriſhed ABDOLLALIPH, who was a teacher of anatomy, a man eminent in his time for learning and curioſity; a great traveller, who had been bred at Bagdad, and had ſeen many of the great cities and principal places for ſtudy in the Saracen empire. But although he had a favourable opinion of original obſervation, in oppoſition to book-learning; and boldly corrected ſome of Galen's errors, and was perſuaded that many more might be detected, yet even this man never made or ſaw, or ſeemed to think of a human diſſection. He diſcovered Galen's errors in the oſteology, by going to burying grounds, with his ſtudents and others, where he examined and demonſtrated the bones; he earneſtly recommended that method of ſtudy, in preference even to the reading of Galen, and thought that many farther improvements might be made; yet he ſeemed not to have an idea that a freſh ſubject might be diſſected with that view. Probably the Jewiſh tenets, which the Mahometans adopted about uncleanneſs and pollution, might prevent their handling dead bodies; or their opinion of what was ſuppoſed to paſs between an angel and the dead perſon, might make them think diſturbing the dead highly ſacrilegious.

(21.) Such, however, as Arabian learning was, for many ages together, there was hardly any other in all the weſtern countries of Europe. It was introduced by the eſtabliſhment of the Saracens in Spain in 711, and kept its ground till the reſtoration of learning in the end of the 15th century. The ſtate of anatomy in Europe, in the times of Arabian influence, may be ſeen by reading a very ſhort ſyſtem of anatomy drawn up by MUNDINUS, in 1315. It was extracted principally from what the Arabians had preſerved of Galen's doctrine; and, rude as it is, in that age, it was judged to be ſo maſterly a performance, that it was ordered, by a public decree, to be read in all the ſchools in Italy; and it actually continued to be almoſt the only book which was read upon the ſubject for above 200 years. Corteſius gives him the credit of being the great reſtorer of anatomy, and the firſt who diſſected human bodies among the moderns.

(22.) The prejudices againſt diſſection, how-

ever, almoſt univerſally prevailed till the 16th century. The Emperor Charles V. ordered a conſultation to be held by the divines of Salamanca, in order to determine whether or not it was lawful to diſſect a dead body! In Muſcovy, till very lately, both anatomy and the uſe of ſkeletons were forbidden, the firſt as inhuman, and the latter as ſubſervient to *witchcraft*.

(23.) In the beginning of the 15th century, learning revived conſiderably in Europe, and particularly phyſic, by means of copies of the Greek authors, brought from the ſack of Conſtantinople; after which the number of anatomiſts and anatomical books increaſed to a prodigious degree.—The Europeans becoming thus poſſeſſed of the ancient Greek fathers of medicine, were for a long time ſo much occupied in correcting the copies they could obtain, ſtudying the meaning, and commenting upon them, that they attempted nothing of their own, eſpecially in anatomy.

(24.) The late Dr HUNTER introduces into the annals of this art, a genius of the firſt rate, LEONARDO DA VINCI, who appeared about this period, and had been formerly overlooked, becauſe he was of another profeſſion, and becauſe he publiſhed nothing upon the ſubject. He is conſidered by the Doctor as by far the beſt anatomiſt and phyſiologiſt of his time; and was certainly the firſt man we know of who introduced the practiſe of making anatomical drawings.

(25.) Vaſſare, in his lives of the painters, ſpeaks of Leonardo thus, after telling us that he had compoſed a book of the anatomy of a horſe, for his own ſtudy: "He afterwards applied himſelf with more diligence to the human anatomy; in which ſtudy he reciprocally received and communicated aſſiſtance to Marc. Antonio della Torre, an excellent philoſopher, who then read lectures in Pavia, and wrote upon this ſubject; and who was the firſt, as I have heard, who began to illuſtrate medicine from the doctrine of Galen, and to give true light to anatomy, which till that time had been involved in clouds of darkneſs and ignorance. In this he availed himſelf exceedingly of the genius and labour of Leonardo, who made a book of ſtudies, drawn with red chalk, and touched with a pen, with great diligence, of ſuch ſubjects as he had himſelf diſſected; where he made all the bones, and to thoſe he joined, in their order, all the nerves, and covered them with the muſcles. And concerning thoſe, from part to part, he wrote remarks in letters of an ugly form, which are written by the left hand, backwards and not to be underſtood but by thoſe who know the method of reading them; for they are not to be read without a looking-glaſs. Of theſe papers of human anatomy, there is a great part in the poſſeſſion of M. Franciſco da Melzo, a Milaneſe gentleman, who, in the time of Leonardo, was a moſt beautiful boy, and much beloved by him, as he is now a beautiful and genteel old man, who reads thoſe writings, and carefully preſerves them, as precious relicts, together with the portrait of Leonardo, of happy memory. It appears impoſſible that that divine ſpirit ſhould reaſon ſo well upon the arteries, and muſcles, and nerves, and veins; and with ſuch diligence of every thing, &c. &c."

(26.) Thoſe very drawings and the writings are happily preſerved in his Majeſty's great collection of original drawings, where the Doctor was permitted to examine them; and his ſentiments upon this occaſion he thus expreſſes: "I expected to ſee little more than ſuch deſigns in anatomy, as might be uſeful to a painter in his own profeſſion; but I ſaw, and indeed with aſtoniſhment, that Leonardo had been a general and a deep ſtudent. When I conſider what pains he has taken upon every part of the body, the ſuperiority of his univerſal genius, his particular excellence in mechanics and hydraulics, and the attention with which ſuch a man would examine and ſee objects which he was to draw, I am fully perſuaded that Leonardo was the beſt anatomiſt at that time in the world. We muſt give the 15th century the credit of Leonardo's anatomical ſtudies, as he was 55 years of age at the cloſe of that century."

(27.) In the beginning of the 16th century, ACHILLINUS and BENEDICTI, but particularly, BERENGARIUS and MASSA, followed out the improvement of anatomy in Italy, where they taught it, and publiſhed upon the ſubject. Theſe firſt improvers made ſome diſcoveries from their own diſſections; but it is not ſurpriſing, that they ſhould have been ſtudent of themſelves, and have followed Galen almoſt blindly, when his authority had been ſo long eſtabliſhed, and when the enthuſiaſm for Greek authors was riſing to ſuch a pitch.

(28.) About the year 1540, the great VESALIUS appeared. He was ſtudious, laborious and ambitious. From Bruſſels, the place of his birth, he went to Louvain, and thence to Paris, where anatomy was not yet making a conſiderable figure, and then to Louvain to teach; from which place, very fortunately for his reputation, he was called to Italy, where he met with every opportunity that ſuch a genius for anatomy could deſire, that is, books, ſubjects, and excellent draughtſmen. He was equally laborious in reading the ancients, and in diſſecting bodies. And in making the compariſon, he could not but ſee, that there was great room for improvement, and that many of Galen's deſcriptions were erroneous. When he was but a young man, he publiſhed a noble ſyſtem of anatomy, illuſtrated with a great number of elegant figures.—In this work he found ſo many occaſions of correcting Galen, that his contemporaries, partial to antiquity, and jealous of his reputation, complained that he carried his turn for improvement and criticiſms to licentiouſneſs.

(29.) The ſpirit of oppoſition and emulation was preſently rouſed; and SYLVIUS in France, COLUMBUS, FALLOPIUS, and EUSTACHIUS in Italy, who were all in high anatomical reputation about the middle of this 16th century, endeavoured to defend Galen at the expence of Veſalius. In their diſputes they made their appeals to the human body: and thus in a few years the art was greatly improved. And Veſalius being detected in the very fault which he condemns in Galen, to wit, deſcribing from the diſſections of brutes, and not of the human body, it expoſed ſo fully that blunder of the older anatomiſts, that in ſucceeding times there has been little reaſon for ſuch complaint.—Beſides the above, he publiſhed ſeveral other anatomical treatiſes. He has been particularly

hily ſerviceable by impoſing *names* on the muſcles, moſt of which are retained to this day. Formerly they were diſtinguiſhed by *numbers*, which were differently applied by almoſt every author.

(30.) In 1561, Gabriel Fallopius profeſſor of anatomy at Padua, publiſhed a treatiſe of anatomy under the title of *Obſervationes Anatomicæ*. This was deſigned as a ſupplement to Veſalius; many of whoſe deſcriptions he corrects, though he always mentions him in an honourable manner. Fallopius made many great diſcoveries, and his book is well worth the peruſal of every anatomiſt. In 1563, BARTHOLOMÆUS EUSTACHIUS, publiſhed his *Opuſcula Anatomica* at Venice, which have ever ſince been juſtly admired for the exactneſs of the deſcriptions, and the diſcoveries contained in them. He publiſhed afterwards ſome other pieces, in which there is little of anatomy; but never publiſhed the great work he had promiſed, which was to be adorned with copperplates repreſenting all the parts of the human body. Theſe plates, after lying buried in an old cloſet for upwards of 150 years, were at laſt diſcovered and publiſhed in the year 1714, by Lancifi the pope's phyſician; who added a ſhort explicatory text, becauſe Euſtachius's own writing could not be found.

(31.) From this time the ſtudy of anatomy gradually diffuſed itſelf over Europe; inſomuch that for the laſt hundred years it has been daily improving by the labour of a number of profeſſed anatomiſts almoſt in every country of Europe. We may form a judgment of the ſtate of anatomy even in Italy, in the beginning of the 17th century, from the information of CORTESIUS. He had been profeſſor of anatomy at Bologna, and was then profeſſor of Medicine at Maſſana; where, though he had a great deſire to improve himſelf in the art, and to finiſh a treatiſe which he had begun on practical anatomy, in 24 years he could never only procure an opportunity of diſſecting a human body, and then it was with difficulties and in a hurry; whereas he had expected to have done ſo, he ſays, "once every year, according to the cuſtom in the famous academies of Italy."

(32.) In the end of the 16th century, our great HARVEY, as was the cuſtom of the times, went to Italy to ſtudy medicine; for Italy was ſtill the favourite ſeat of the arts: And in the beginning of the 17th century, ſoon after Harvey's return to England, his maſter in anatomy, FABRICIUS AB AQUAPENDENTE, publiſhed an account of the valves in the veins, which he had diſcovered many years before, and no doubt taught in his lectures when Harvey attended them. This diſcovery evidently affected the eſtabliſhed doctrine of all ages, that the veins carried the blood from the liver to all parts of the body for nouriſhment. It ſet Harvey to work upon the uſe of the heart and vaſcular ſyſtems in animals; and in the courſe of ſome years, he was ſo happy as to diſcover, and to prove beyond all poſſibility of doubt, the CIRCULATION OF THE BLOOD. He taught his new doctrine in his lectures about the year 1616, and printed it in 1628.

(33.) This was by far the moſt important ſtep that has been made in the knowledge of animal bodies in any age. It not only reflected light upon what had been already found out in anatomy, but alſo pointed out the means of further inveſtigation. And accordingly we ſee, that from Harvey to the preſent time, anatomy has been ſo much improved, that we may reaſonably queſtion, if the ancients have been further outdone by the moderns, in any other branch of knowledge. From one day to another there has been a conſtant ſucceſſion of diſcoveries, relating either to the ſtructure or functions of our body; and new anatomical proceſſes, both of inveſtigation and demonſtration, have been daily invented. Many parts of the body, which were not known in Harvey's time, have ſince been brought to light: and of thoſe which were known, the internal compoſition and functions remained unexplained; and indeed muſt have remained inexplicable without the knowledge of the circulation.

(34.) HARVEY'S doctrine at firſt met with conſiderable oppoſition; but in the ſpace of about 20 years it was ſo generally and ſo warmly embraced, that it was imagined every thing in phyſic would be explained. But time and experience have taught us, that we ſtill are, and probably muſt long continue to be, very ignorant; and that in the ſtudy of the human body, and of its diſeaſes, there will always be an extenſive field for the exerciſe of ſagacity.

(35.) The next queſtion, after the diſcovery and knowledge of the circulation of the blood, would naturally have been about the paſſage and route of the nutritious part of the food or chyle, from the bowels to the blood veſſels: And, by good fortune, in a few years after Harvey had made his diſcovery, ASELLIUS, an Italian phyſician, found out the lacteals, or veſſels which carry the chyle from the inteſtines; and printed his account of them, with coloured prints, in the year 1627, the very year before Harvey's book came out.

(36.) For many years after theſe two publications, anatomiſts in all parts of Europe, were daily opening living dogs, either to ſee the lacteals, or to obſerve the phenomena of the circulation.—In making experiments of this kind, PECQUET in France was fortunate enough to diſcover the thoracic duct, or common trunk of all the lacteals, which conveys the chyle into the ſubclavian vein. He printed his diſcovery in the year 1651. And now the lacteals having been traced from the inteſtines to the thoracic duct, and that duct having been traced to its termination in a blood veſſel, the paſſage of the chyle was completely made out.

(37.) The ſame practice of opening living animals furniſhed occaſion of diſcovering the lymphatic veſſels. This good fortune fell firſt to the lot of RUDBEC, a young Swediſh anatomiſt; and then to THOMAS BARTHOLINE, a Daniſh anatomiſt, who was the firſt who appeared in print upon the lymphatics. His book came out in 1653, two years after that of Pecquet. And then it appeared evident that they had been ſeen before by Dr HIGMORE and others, who had miſtaken them for lacteals. But none of the anatomiſts of thoſe times could make out the origin of the lymphatics, and none of the phyſiologiſts could give a ſatisfactory account of their uſe.

(38.) The circulation of the blood, and the paſſage

paſſage of the chyle having been ſatisfactorily traced out in full grown animals, the anatomiſts were naturally led next to conſider how theſe animal proceſſes were carried on in the child while in the womb of the mother. Accordingly, the male and female organs, the appearances and contents of the pregnant uterus, the incubated egg, and every phenomenon which could illuſtrate generation, became the favourite ſubject for about 30 years with the principal anatomiſts of Europe. Thus it would appear to have been in theory: but Dr Hunter believes, that in fact, as Harvey's maſter Fabricius laid the foundation for the diſcovery of the circulation of the blood, by teaching him the valves of the veins, and thereby inviting him to conſider that ſubject; ſo Fabricius, by his lectures, and by his elegant work *De Formato Fœtu, et de Formotione Ovi et Pulli*, probably made that likewiſe a favourite ſubject with Dr Harvey. But whether he took up the ſubject of generation in conſequence of his diſcovery of the circulation, or was led to it by his honoured maſter Fabricius, he ſpent a great deal of his time in the inquiry; and publiſhed his obſervations in a book *De Generatione Animalium*, in 1651, that is, ſix years before his death.

(39.) SWAMMERDAM, VAN HORN, STENO, and DE GRAAF, within a few years after, excited great attention to the ſubject of generation, by their ſuppoſed diſcovery that the females of viviparous animals have ovaria, that is, cluſters of eggs in their loins, like oviparous animals; which, when impregnated by the male, are conveyed into the uterus: ſo that, according to their doctrine, a child is produced from an egg as well as a chick; with this difference, that the one is hatched within, and the other without the body of the mother.

(40.) Sometime after, MALPIGHI, a great Italian genius, made conſiderable advances upon the ſubject of generation. He was the firſt who uſed magnifying glaſſes with addreſs in tracing the firſt appearances in the formation of animals. He likewiſe made many other obſervations and improvements in the *minutiæ* of anatomy by his microſcopical labours, and by cultivating comparative anatomy.—This diſtinguiſhed anatomiſt gave the firſt public ſpecimen of his abilities by printing a diſſertation on the lungs *anno* 1661; a period ſo remarkable for the ſtudy of nature, that it would be injuſtice to paſs it without particular notice.—At the ſame time flouriſhed LAURENTIUS BELLINUS at Florence, the firſt who introduced mathematical reaſoning into phyſic. In 1662, SIMON PAULI publiſhed a treatiſe *De albandis oſſibus*. He had long been admired for the white ſkeletons he prepared; and at laſt diſcovered his method, which was by expoſing the bones to the weather during winter.

(41.) JOHANNES SWAMMERDAM of Amſterdam alſo publiſhed ſome anatomical treatiſes; but was moſt remarkable for his art of preſerving the parts of bodies entire for many years, by injecting their veſſels. He alſo publiſhed a treatiſe on reſpiration; wherein he mentioned his having figures of all the parts of the body, as big as the life, cut in copper, which he deſigned to publiſh, with a complete ſyſtem of anatomy. Theſe, however, were never made public by Swammerdam; but, in 1683, GOTHOFRIDUS BIDLOO, profeſſor of anatomy at Leyden, publiſhed a work intitled *Anatomia corporis humani*, wherein all the parts were delineated in very large plates almoſt as big as the life. Mr COWPER, an Engliſh ſurgeon, bought 300 copies of theſe figures; and in 1698, publiſhed them with an Engliſh text, quite different from Bidloo's Latin one; to which were added letters in Bidloo's figures, and ſome few figures of Mr Cowper's own. To this work Cowper's name was prefixed, without the leaſt mention of Bidloo except on purpoſe to confute him. Bidloo immediately publiſhed a very ill-natured pamphlet, called *Gulielmus Cowperus citatus coram tribunali*; appealing to the Royal Society, how far Cowper ought to be puniſhed as a plagiary of the worſt kind, and endeavouring to prove him an ignorant and deceitful fellow. Cowper anſwered him in his own ſtyle, in a pamphlet called his *Vindiciæ*; endeavouring to prove, either that Bidloo did not underſtand his own tables, or that they were none of his. It was even alledged that thoſe were the tables promiſed by Swammerdam, and which Bidloo had got from his widow. This, however, appears to have been only an invidious ſurmiſe, there being unqueſtionable evidence that they were really the performance of Bidloo.

(42.) ISBRANDUS DIEMBROECK, profeſſor of anatomy at Utrecht, ſoon after made his appearance as an anatomical author. His work contained very little original; but he was at great pains to collect from others whatever was valuable in their writings, and his ſyſtem was the common ſtandard among anatomical ſtudents for many years.

(43.) ANTONIUS LIEWENHOECK of Delft, about the ſame time, improved conſiderably on Malpighi's uſe of microſcopes. Theſe two authors took up anatomy where others had dropt it; and, by this new art, they brought a number of amazing things to light. They diſcovered the red globules of the blood; they were enabled to ſee the actual circulation of the blood in the tranſparent parts of living animals, and could meaſure the velocity of its motion; they diſcovered that the arteries and veins had no intermediate cells or ſpungy ſubſtance, as Harvey and all the preceding anatomiſts had ſuppoſed, but communicate one with the other by a continuation of the ſame tube. Liewenhoeck obtained great fame likewiſe for his diſcovery of the animalcula in the ſemen. Indeed there was ſcarcely a part of the body, ſolid or fluid, which eſcaped his examination; and he almoſt every where found, that what appeared to the naked eye to be rude undigeſted matter, was in reality a beautiful and regular compoſition.

(44.) Not long after this period, NUCK added to our knowledge of the abſorbent ſyſtem already mentioned, by his injections of the lymphatic glands; RUYSCH, by his deſcription of the valves of the lymphatic veſſels; and MECKEL, by his accurate account of the whole ſyſtem, and by tracing thoſe veſſels in many parts where they had not before been deſcribed.

(45.) The attention of the public has alſo been particularly called to this part of anatomy, by Mr HUNTER and Dr MONRO, in their controverſy concerning

concerning the diſcovery of the office of the lymphatics.—When the lymphatic veſſels were firſt ſeen and traced into the thoracic duct, it was natural for anatomiſts to ſuſpect, that as the lacteals abſorbed from the cavity of the inteſtines, the lymphatics, which are ſimilar in figure and ſtructure, might poſſibly do the ſame office with reſpect to other parts of the body: and accordingly, Dr GLISSON, who wrote in 1654, ſuppoſes theſe veſſels aroſe from cavities, and that their uſe was to abſorb; and FREDERIC HOFFMAN has very explicitly laid down the doctrine of the lymphatic veſſels being a ſyſtem of abſorbents. But anatomiſts in general have been of a contrary opinion; for from experiments, particularly ſuch as were made by injections, they have been perſuaded that the lymphatic veſſels did not ariſe from cavities, and did not abſorb, but were merely continuations from ſmall arteries. The doctrine, therefore that the lymphatics, like the lacteals, were abſorbents, as had been ſuggeſted by Gliſſon and Hoffman, has been revived by Mr Hunter and Dr Monro, who have controverted the experiments of their predeceſſors in anatomy, and have endeavoured to prove that the lympatic veſſels are not continued from arteries, but are abſorbents.

(46.) Several objections have been ſtarted to this doctrine, particularly by HALLER (Elm. Phyſ. l. 24. § 2, 3.); and it has been found, that before the doctrine of the lymphatics being a ſyſtem of abſorbents can be eſtabliſhed, it muſt firſt be determined whether this ſyſtem is to be found in other animals beſides man and quadrupeds.—Mr HEWSON claims the merit of having proved the affirmative of this queſtion, by diſcovering the lymphatic ſyſtem in birds, fiſh, and amphibious animals. See *Phil. Tranſ.* vol. lvii. and lxix. And Mr CRUIKSHANK has traced the ramifications of that ſyſtem in almoſt every part of the body; and from his diſſections, figures have been made and lately publiſhed to the world. To Mr SHELDON alſo, we are much indebted for his illuſtration of this ſyſtem, which promiſes to give great ſatisfaction.

(47.) Conſiderable light has alſo been thrown upon the ſubject of the gravid uterus, particularly relating to one very important diſcovery; viz. that the internal membrane of the uterus, which Dr Hunter has named *decidua*, conſtitutes the exterior part of the ſecundines or after-birth, and ſeparates from the reſt of the uterus every time that a woman bears a child or ſuffers a miſcarriage. This diſcovery includes another, to wit, that the placenta is partly made up of an excreſcence or efflorescence from the uterus itſelf. Theſe diſcoveries are of the utmoſt conſequence, both in the phyſiological queſtion about the connection between the mother and child, and likewiſe in explaining the phenomena of births and abortions, as well as in regulating obſtetrical practice.

(48.) The anatomiſts of the preſent century have made the ſtudy of it much more eaſy, by giving us more correct as well as more numerous figures. We have had four large folio books of bones, viz. CHESELDEN's, ALBINUS's, SOEMMERING's, and TREW's. Of the muſcles, we have had two large folios: one from Cowper, which is elegant and one from Albinus, which, from the accuracy and labour of the work, we may ſuppoſe will never be outdone. Of the blood-veſſels we have a large folio from Dr Haller. We have had one upon the nerves from Dr Meckel, and another by Dr Monro junior. We have had Albinus's, Roederer's, Jenty's, and Hunter's works upon the pregnant uterus; Weibrecht and Leber on the joint's and freſh bones; Soemerring on the brain; Zinn on the eye; Cotunnius, Mekel junior, &c. on the ear; Walter on the nerves of the thorax and abdomen: Dr Monro on the burſæ mucoſæ, &c. It would be endleſs to enumerate the anatomical figures that have been publiſhed in this century, of particular and ſmaller parts of the body by Morgagni, Ruyſch, Vaſalva, Sanctorini, Heiſter, Vater, Cant, Zimmerman, Walterus, and others.

(49.) Thoſe elegant plates of the brain, however, publiſhed by M. VICQ. D'AZYR, muſt not paſs without notice, eſpecially as they form part of an univerſal ſyſtem of anatomy and phyſiology, both human and comparative, propoſed to be executed in the ſame ſplendid ſtyle. Upon the brain alone 19 folio plates are employed; of which ſeveral are coloured. The figures are delineated with accuracy and clearneſs; but the colouring is rather beautiful than correct. Such parts of this work as may be publiſhed, cannot fail to be equally acceptable to the anatomiſt and philoſopher: but the entire deſign is apparently too extenſive to be accompliſhed within the period of a ſingle life. In our own country, alſo, a very great anatomical work has been executed by Andrew Bell, F. S. A. S. engraver to the Prince of Wales, with the approbation of Dr MONRO, and under the inſpection of his ingenious aſſiſtant Mr FYFE. It contains a complete illuſtration, both general and particular, of the human body, by a ſelection from the beſt plates of all the greateſt anatomiſts, exhibiting the lateſt diſcoveries in the ſcience, and accompanied with copious explanations. The whole number of plates is 240, all in royal folio.

(50) To the foreign treatiſes already mentioned may be added thoſe recently publiſhed by SABBATIER and PLENCK on anatomy in general. Among ourſelves the writings of KEIL, DOUGLAS, Cheſelden, the firſt MONRO, WINSLOW, &c. are too well known to need deſcription. The laſt of theſe uſed to be recommended as a ſtandard for the ſtudents of anatomy; but it has of late given place to a more accurate and comprehenſive ſyſtem, in 3 vols. publiſhed on a plan approved of by Dr Monro, and executed by Mr Fyfe. Dr SIMMONS of London has obliged the world with an excellent ſyſtem of anatomy; and another work, under the title of Elements of Atomy and the Animal Œconmy: in which the ſubjects are treated with uncommon elegance and perſpicuity.

(51.) About the end of the 17th century, anatomy was much benefited by the invention of injections, and the method of making what are commonly, called *preparations*. Theſe two arts have doubtleſs been of infinite uſe to anatomy; and have introduced an elegance into its adminiſtrations, which in former times could not have been ſuppoſed; of ſible.

They

They arose in Holland under Swammerdam and Ruysch, and afterwards in England under Cowper, St André, and others, where they have been greatly improved, in the course of last century.

(52.) The anatomists of former ages had no other knowledge of the blood-vessels, than what they were able to collect from laborious dissections, and from examining the smaller branches of them, upon some lucky occasion, when they were found more than commonly loaded with red blood. But filling the vascular system with a bright coloured wax, enables us to trace the large vessels with great ease, renders the smaller much more conspicuous, and makes thousands of the very minute ones visible, which from their delicacy, and the transparency of their natural contents, are otherwise imperceptible. The modern art of corroding the fleshy parts with a menstruum, and of leaving the moulded wax entire, is so exceedingly useful, and at the same time so ornamental, that it does great honour to the ingenious inventor, Dr NICHOLLS.

(53.) The representations in wax-work of the various parts of the human body, might deserve notice in a history of anatomy, if those who model these figures had not been so careless in their imitation. Many of the wax figures are so tawdry, with a show of unnatural colours, and so very incorrect in the circumstances of figure, situation, and the like, that though they strike a vulgar eye with admiration, they must appear ridiculous to an anatomist. But those figures which are cast in wax, plaster, or lead, from the real subject, and which of late years have been frequently made here, are, of course, very correct in all the principal parts, and may be considered as no insignificant acquisition to modern anatomy. The proper, or principal use of this art is, to preserve a perfect likeness of such subjects as we seldom can meet with, or cannot well preserve in a natural state; *e. g.* subjects in pregnancy, &c.

(54.) The improved methods of preserving animal bodies, or parts of them, has been of the greatest service to anatomy; especially in saving the time and labour of the anatomist in the nicer dissections of the small parts of the body. For now, whatever he has prepared with care, he can preserve; and the object is ready to be seen at any time. And in the same manner he can preserve anatomical curiosities, or rarities of every kind; such as, parts that are uncommonly formed; parts that are diseased; the parts of the pregnant uterus and its contents, &c. Large collections of such curiosities, which modern anatomists are striving almost everywhere to procure, are of infinite service to the art, especially in the hands of teachers. They give students clear ideas about many things which it is very essential to know, and which yet it is impossible that a teacher should be able to show otherwise, were he ever so well supplied with fresh subjects.

SECT. III. GENERAL VIEW *of the* SUBJECT.

(55.) ANATOMY, considered merely as a branch of philosophy, seldom fails to attract the curiosity of people of taste. The advice of the Grecian sage, *Know thyself*, will doubtless apply to the knowledge of our corporeal frame, as well as to that of our intellectual. And if it is pleasing to be acquainted with the general structure of the body, it is certainly more so to discover all those springs which give life and motion to the machine, and to observe the admirable mechanism by which so many different functions are executed. Astronomy and anatomy, as Dr Hunter and Fontenelle have remarked, are studies which present us with the most striking view of the two greatest attributes of the Supreme Being. The first fills the mind with the idea of his immensity, in the magnitude, distances, and number of the heavenly bodies; the last, astonishes with his wisdom, in the variety, delicacy, and minuteness of animal mechanism.

(56.) The human body has been stiled a microcosm, or little world; as if it did not differ so much from the universal system of nature in the symmetry and number of its parts as in their size. Galen's excellent treatise *De usu partium*, was composed as a prose hymn to the Creator; and abounds with as irresistible proofs of a supreme Cause and governing Providence, as we find in modern physico-theology. And Cicero dwells more on the structure and œconomy of animals than on all the productions of nature besides, when he proves the existence of the gods from the order and beauty of the universe. It would be endless to quote the many animated passages on this subject which are to be found in the works of those physicians, philosophers, and theologists, who have considered the structure and functions of animals with a view towards the Creator. It is a view which must strike one with a most awful conviction. Who can know and consider the thousand evident proofs of the astonishing art of the Creator, in forming and sustaining an animal body such as ours, without feeling the most pleasant enthusiasm? Can we seriously reflect upon this awful subject, without being almost lost in adoration? without longing for another life after this, in which we may be gratified with the highest enjoyment, which our faculties and nature seem capable of, seeing and comprehending the whole plan of the Creator, in forming the universe, and in directing all its operations?

(57.) Yet obvious as these reflections appear to be, they are far from striking *all* anatomists, with equal force. It is said, that the great Galen owed his conversion from infidelity, or rather from *atheism*, to such serious reflections arising in his mind from viewing a human skeleton. On the other hand, some modern practitioners pretend to draw the very contrary inference; and because in their dissections of the human brain, they can discover nothing but matter, presume to draw the absurd inference, not only that *matter*, of itself, in a certain state of organization, is capable of *thinking*, without *spirit*, but also the impious conclusion, that *nothing else* exists in the universe! Similar false reasonings and absurd conclusions of medical practitioners in some former age, seem to have given rise to the illiberal adage, *Ubi tres medici, ibi duo athei*;—a proverb, which a numerous list of respectable names, in our own age and country is sufficient to refute.

(58.) The more immediate purposes of anatomy, however, concern those who are to be the guardians,

guardians of health, as this ſtudy is neceſſary to be a foundation for all the branches of medicine. —The more we know of our fabric, the more reaſon we have to believe, that if our ſenſes were more acute, and our judgment more enlarged, we ſhould be able to trace many ſprings of life, which are now hidden from us: by the ſame ſagacity we ſhould diſcover the true cauſe and nature of diſeaſes; and thereby be enabled to reſtore the health of many, who are now, from our more confined knowledge, ſaid to labour under incurable diſorders. By ſuch an intimate acquaintance with the œconomy of our bodies, we ſhould diſcover even the ſeeds of diſeaſes, and deſtroy them before they had taken root in the conſtitution.

(59.) That anatomy is the very baſis of ſurgery our body allows. It is diſſection alone that can teach us, where we may cut the living body with freedom and diſpatch; and where we may venture with great circumſpection and delicacy; and where we muſt not, upon any account, attempt it. This informs the *head*, gives dexterity to the *hand*, and familiarizes the *heart* with a ſort of inhumanity, to the uſe of cutting inſtruments upon our fellow creatures. Beſides the knowledge of our body, through all the variety of its *ſtructure* and *operations* in a *ſound* ſtate, it is by anatomy only that we can arrive at the knowledge of the true nature of moſt of the diſeaſes which afflict humanity. The ſymptoms of many diſorders are often equivocal; and diſeaſes themſelves are thence frequently miſtaken, even by ſenſible, experienced, and attentive phyſicians. But by anatomical examination after death, we can with certainty find out the miſtake, and learn to avoid it in any ſimilar caſe.

(60.) This uſe of anatomy has been ſo generally obſerved by the moderns, that the caſes already publiſhed are almoſt innumerable: MANGETUS, MORGAGNI, and many of the beſt modern writers in phyſic are full of them. And if we look among the phyſicians of the beſt character, and above thoſe who have the *art* itſelf, rather than the *craft* of the profeſſion at heart; we ſhall find them conſtantly requeſting leave to examine, after death, the bodies of ſuch patients as have died of any extraordinary or unaccountable diſeaſe. And certainly in all ſuch caſes, thoſe ſurviving relations, who would refuſe a phyſician this privilege, would ſhow a great want of public ſpirit and philanthropy.

(61.) Having thus conſidered the riſe and progreſs of anatomy; the various diſcoveries that have been made in it, from time to time; the great number of diligent obſervers who have applied themſelves to this art; and the importance of the ſtudy, not only for the prevention and cure of diſeaſes, but in furniſhing the livelieſt proofs of divine wiſdom; the following queſtions ſeem naturally to ariſe: For what purpoſe is there ſuch variety of parts in the human body? Why ſuch a complication of nice and tender machinery? Why was there not rather a more ſimple, leſs delicate, and leſs expenſive frame?

(62.) The late ingenious Mr Hunter has anſwered all ſuch queſtions, in a very ſatisfactory manner, in his introductory lecture on anatomy; wherein after ſuppoſing that an *immaterial ſpirit* is about to be placed in a *corporeal* fabric, he commences an inquiry what will be neceſſary for her accommodation. "Firſt, then," ſays he "the *mind*, the thinking immaterial agent, muſt be provided with a place of immediate reſidence, which ſhall have all the requiſites for the union of ſpirit and body; accordingly ſhe is provided with the *brain*, where ſhe dwells as governor and ſuperintendant of the whole fabric. In the next place, as ſhe is to hold a correſpondence with all the material beings around her, ſhe muſt be ſupplied with organs fitted to receive the different kinds of impreſſions which they will make. In fact, therefore, we ſee that ſhe is provided with the organs of ſenſe, as we call them; the eye is adapted to light; the ear to ſound; the noſe to ſmell; the mouth to taſte; and the ſkin to touch.

(63.) "Farther; She muſt be furniſhed with organs of communication between herſelf in the brain and thoſe organs of ſenſe, to give her information of all the impreſſions that are made upon them: and ſhe muſt have organs between herſelf in the brain and every other part of the body, fitted to convey her commands and influence over the whole. For theſe purpoſes the nerves are actually given. They are chords, which riſe from the brain, the immediate reſidence of the mind, and diſperſe themſelves in branches through all parts of the body. They convey all the different kinds of ſenſations to the mind, in the brain; and likewiſe carry out from thence all her commands or influence to the other parts of the body. They are intended to be occaſional moniters againſt all ſuch impreſſions as might endanger the well-being of the whole, or of any particular part; which vindicates the Creator of all things, in having actually ſubjected us to thoſe many diſagreeable and painful ſenſations, which we are expoſed to from a thouſand accidents in life. Moreover, the mind, in this corporeal ſyſtem, muſt be endued with the power of moving from place to place, that ſhe may have intercourſe with a variety of objects; that ſhe may fly from ſuch as are diſagreeable, dangerous, or hurtful, and purſue ſuch as are pleaſant or uſeful to her. And accordingly ſhe is furniſhed with limbs, and with muſcles and tendons, the inſtruments of motion, which are found in every part of the fabric where motion is neceſſary.

(64.) "But to ſupport, to give firmneſs and ſhape in the fabric; to keep the ſofter parts in their proper places; to give fixed points for, and the proper direction to its motions, as well as to protect ſome of the more important and tender organs from external injuries; there muſt be ſome firm prop-work interwoven through the whole, And in fact, for ſuch purpoſes the bones are given. The prop-work muſt not be made into one rigid fabric, for that would prevent motion.—Therefore there are a number of bones. Theſe pieces muſt all be firmly bound together, to prevent their diſlocation. And this end is perfectly well anſwered by the ligaments. The extremities of theſe bony pieces, where they move and rub upon one another, muſt have ſmooth and ſlippery ſurfaces for eaſy motion. This is moſt happily provided for, by the cartilages and mucus of the joints. The interſtices of all theſe parts

muſt be filled up with ſome ſoft and ductile matter, which will keep them in their places, unite them, and at the ſame time allow them to move a little upon one another. And theſe purpoſes are anſwered by the cellular membrane or adipoſe ſubſtance. There muſt be an outward covering over the whole apparatus, both to give it compactneſs and to defend it from a thouſand injuries; which, in fact, are the very purpoſes of the ſkin and other integuments.

(65.) "Laſtly, the mind being formed for ſociety and intercourſe with beings of her own kind, ſhe muſt be endued with powers of expreſſing and communicating her thoughts by ſome ſenſible marks or ſigns; which ſhall be both eaſy to herſelf, and admit of great variety: and accordingly ſhe is provided with the organs and faculty of ſpeech, by which ſhe can throw out ſigns with amazing facility, and vary them without end.

(66.) "Thus we have built up an animal body, which would ſeem to be pretty complete: but as it is the nature of matter to be altered and worked upon by matter; ſo in a very little time ſuch a living creature would be deſtroyed, if there is no proviſion for repairing the injuries which ſhe muſt commit upon herſelf, and thoſe which ſhe muſt be expoſed to from without. Therefore a treaſure of blood is actually provided in the heart and vaſcular ſyſtem, full of nutritious and healing particles, fluid enough to penetrate into the minuteſt parts of the animal; impelled by the heart, and conveyed by the arteries, it waſhes every part, builds up what was broken down, and ſweeps away the old and uſeleſs materials. Hence we ſee the neceſſity or advantage of the heart and arterial ſyſtem. What more there is of this blood than enough, to repair the preſent damages of the machine, muſt not be loſt, but ſhould be returned again to the heart; and for this purpoſe the venous ſyſtem is actually provided. Theſe requiſites in the animal explain *a priori*, the circulation of the blood.

(67.) "The old materials which were become uſeleſs, and are ſwept off by the current of blood, muſt be ſeparated and thrown out of the ſyſtem. Therefore glands, the organs of ſecretion, are given for ſtraining whatevet is redundant, vapid or noxious from the maſs of blood; and when ſtrained, they are thrown out by emunctories, called organs of excretion. But now as the machine muſt be conſtantly wearing, the reparation muſt be carried on without intermiſſion, and the ſtrainers muſt always be employed. Therefore there is actually a perpetual circulation of the blood, and the ſecretions are always going on.

(68.) "Even all this proviſion, however, would not be ſufficient; for that ſtore of blood would ſoon be conſumed, and the fabric would break down, if there were not a proviſion made for freſh ſupplies. Theſe we obſerve, in fact, are profuſely ſcattered round her in the animal and vegetable kingdoms; and ſhe is provided with hands the fitteſt inſtruments that could have been contrived, for gathering them, and for preparing them in a variety of ways for the mouth. But theſe ſupplies, which we call food, muſt be conſiderably changed; they muſt be converted into blood. Therefore ſhe is provided with teeth for cutting and bruiſing the food, and with a ſtomach for melting it down: In ſhort, with all the organs ſubſervient to digeſtion.—The finer parts of the aliments only can be uſeful in the conſtitution: theſe muſt be taken up and conveyed into the blood, and the dregs muſt be thrown off. With this view the inteſtinal canal is actually given. It ſeparates the nutritious part, which we call *chyle*, to be conveyed into the blood by the ſyſtem of abſorbent veſſels; and the feces paſs downwards, to be conducted out of the body.

(69.) "Now we have got our animal not only furniſhed with what is wanted for its immediate exiſtence, but alſo with the powers of protracting that exiſtence to an indefinite length of time. But its duration, we may preſume, muſt neceſſarily be limited: for, as it is nouriſhed, grows, and is raiſed up to its full ſtrength and utmoſt perfection; ſo it muſt in time, in common with all material beings, begin to decay, and then hurry on to final ruin. Hence we ſee the neceſſity of a ſcheme for renovation. Accordingly wiſe Providence, to perpetuate, as well as preſerve his work, beſides giving a ſtrong appetite for life and ſelf-preſervation, has made animals male and female, and given them ſuch organs and paſſions as will ſecure the propagation of the ſpecies to the end of time.

(70.) "Thus we ſee, that by the very imperfect ſurvey which human reaſon is able to take of this ſubject, the animal muſt neceſſarily be complex in his corporeal ſyſtem, and in its operations. He muſt have one great and general ſyſtem, the vaſcular, branching through the whole for circulation: Another, the nervous, with its appendages the organs of ſenſe, for every kind of feeling: And a third, for the union and connection of all theſe parts. Beſides theſe primary and general ſyſtems, he requires others which may be more local or confined: One for ſtrength, ſupport, and protection; the bony compages: Another for the requiſite motions of the parts among themſelves, as well as for moving from place to place; the muſcular part of the body: Another to prepare nouriſhment for the daily recruit of the body; the digeſtive organs: and one for propagating the ſpecies; the organs of generation.

(71.) "In taking this general ſurvey of what would appear, *a priori*, to be neceſſary for adapting an animal to the ſituations of life, we obſerve, with great ſatisfaction, that man is accordingly of ſuch ſyſtems, and for ſuch purpoſes. He has them all; and he has nothing more, except the organs of reſpiration. Breathing it ſeemed difficult to account for *a priori*: we only knew it to be in fact eſſentially neceſſary to life. Notwithſtanding this, when we ſaw all the other parts of the body, and their functions, ſo well accounted for, and ſo wiſely adapted to their ſeveral purpoſes, there could be no doubt that reſpiration was ſo likewiſe: And accordingly, the diſcoveries of Dr Prieſtley have lately thrown light upon this function alſo, as will be ſhown in its proper place."

(72.) "Of all the different ſyſtems in the human body, the uſe and neceſſity are not more apparent, than the wiſdom and contrivance which has been exerted, in putting them all into the moſt compact and convenient form: in diſpoſing them ſo, that they

they shall mutually receive, and give helps to one another; and that all, or many of the parts, shall not only answer their principal end or purpose, but operate successfully and usefully in a variety of secondary ways. If we consider the whole animal machine in this light, and compare it with any machine in which human art has exerted its utmost, we shall be convinced, beyond the possibility of doubt, that there are intelligence and power far surpassing what humanity can boast of.

(73.) "One superiority in the natural machine is peculiarly striking.—In machines of human contrivance or art, there is no internal power, no principle in the machine itself, by which it can alter and accommodate itself to an injury which it may suffer, or make up any injury which admits of repair. But in the natural machine, the animal body, this is most wonderfully provided for, by internal powers in the machine itself; many of which are not more certain and obvious in their effects, than they are above all human comprehension as to the manner and means of their operation. Thus, a wound heals up of itself; a broken bone is made firm again by a callus; a dead part is separated and thrown off; noxious matters are driven out by some of the emunctories; a redundancy is removed by some spontaneous bleeding; a bleeding naturally stops of itself; and a great loss of blood, from any cause, is in some measure compensated, by a contracting power in the vascular system, which accommodates the capacity of the vessels to the quantity contained. The stomach gives intimation when the supplies have been expended; represents, with great exactness, the quantity and quality of what is wanted in the present state of the machine; and in proportion as its wants with neglect, rises in her demand, urges her petition in a louder tone, and with more forcible arguments. For its protection, an animal body resists heat and cold in a very wonderful manner, and preserves an equal temperature in a burning and in a freezing atmosphere.

(74.) "A farther excellence or superiority in the animal machine, if possible, still more astonishing, rises beyond all human comprehension, than what we have been speaking of, is the following. Besides those internal powers of self-preservation in each individual, when two of them, of different sexes, cooperate, or act in concert, they are endued with powers of making other animals or machines like themselves, which again are possessed of the same powers of producing others, and so of multiplying the species without end. These are powers which mock all human invention or imitation. They are characteristics of the DIVINE ARCHITECT."

SECT. IV. PLAN *of the* FOLLOWING TREATISE *of* ANATOMY.

(75.) Having thus given a general account of the subject, we shall next consider the method to be observed in treating it. The study of the human body, as already noticed, is commonly divided into two parts. The first, which is called ANATOMY, relates to the matter and structure of its parts; the second, called PHYSIOLOGY and *Animal Economy*, relates to the principles and laws of its internal operations and functions. As the body is a compound of solids and fluids, *Anatomy* is divided into, 1. The Anatomy of the solids, and 2. The Anatomy of fluids.

(76.) I. The SOLIDS, by which me mean all parts of our body, which are not fluid, are generally divided into two classes, viz. 1. The hard solids or bones. This part of anatomy is called OSTEOLOGY; which signifies the doctrine of the bones. 2. The softer solids; which part is called SARCOLOGY, viz. the doctrine of the flesh.

(77.) This division of the solids, has probably taken its origin from the vulgar observation, that the body is made of bones and flesh. And as there are many different kinds of what are called soft or fleshy parts, SARCOLOGY is subdivided into 1. ANGEIOLOGY, or the doctrine of vessels; by which is commonly understood *blood-vessels*; 2. ADENOLOGY, of glands: 3. NEUROLOGY, of nerves: 4. MYOLOGY, of muscles: and, 5, SPLANCHNOLOGY, of the viscera or bowels. There is, besides, that part which treats of the organs of sense and of the integuments.

(78.) This division of the solids is mentioned, rather for the sake of explaining so many words, which are constantly used by anatomists, than for its importance or accuracy. For besides many other objections that might be urged, there are in the body three species of solids, viz. gristle or cartilage, hair, and nails, which are of an intermediate nature between bone and flesh, and therefore cannot so properly be brought into either the osteology or the sarcology. The cartilages are classed with the bones; because the greatest number of them are apendages to bones: and for the like reason the hair and the nails are classed with the integuments.

(79.) II. The FLUIDS of the human body may be divided into *three* kinds, which Dr Hunter calls the *crude*, the *general* or *perfect*, and the *local* or *secreted fluid*. 1. By the *crude* fluid is meant the chyle, and whatever is absorbed at the surfaces of the body; in other words, what is recently taken into the body, and is not yet mixed with, or converted into blood. 2. The *general* or *perfect* fluid is the blood itself; to wit, what is contained in the heart, arteries, and veins, and is going on in the round of the circulation. 3. The *local* or *secreted* are those fluids peculiar to particular parts of the body, which are strained off from the blood, and yet are very different in their properties from the blood. They are commonly called *secretions*; and some are useful, others excrementitious.

(80.) In treating of the *Physiology*, it is very difficult to say what plan should be followed; for every method which has yet been proposed, is attended with manifest inconvenience. The powers and operations of the machine have such a dependence upon one another, such connections and reciprocal influence, that they cannot well be understood or explained separately. In this sense our bodies may be compared to a circular chain of powers, in which nothing is first or last, nothing solitary or independent; so that wherever we begin, we find that there is something preceding which we ought to have known. If we begin with the brain and the nerves, for example, we shall find that these cannot exist, even in idea,

without the heart: if we ſet out with the heart and vaſcular ſyſtem, we ſhall preſently be ſenſible that the brain and nerves muſt be ſuppoſed: or, ſhould we take up the mouth, and follow the courſe of the aliment, we ſhould find that the very firſt organ which preſented itſelf, ſuppoſed the exiſtence both of the heart and brain: Wherefore we ſhall incorporate the Phyſiology with the Anatomy, by attempting to explain the functions after we have demonſtrated the organs.

SECT. V. EXPLANATION *of the* GENERAL TERMS *of* ANATOMY.

(81.) All the ſolid parts of the body, (which are the chief ſubjects of anatomy, properly ſo called,) have been arranged under general claſſes, expreſſed by the names of bones, cartilages, ligaments, fibres, membranes, arteries, veins, nerves, muſcles, glands, &c. Theſe terms it is proper to explain, before we enter more particularly upon the ſubject.

(82.) A BONE is that hard, ſolid, and moſt inflexible part of the body, which aſſiſts in forming the great frame work of the human machine.—The bones having no nerves, are quite inſenſible.

(83.) A CARTILAGE is that whitiſh or pearl-coloured ſubſtance, which uſually covers the extremities of a bone. Cartilages are ſofter than bone, but harder than any other part; ſmooth, pliable, and elaſtic.

(84.) A LIGAMENT is a white, fibrous, compact ſubſtance, more pliable than a cartilage, difficult to be broken or torn, and yielding but a very little when ſtretched. Bones, cartilages, and ligaments, will be deſcribed in their proper places.

(85.) FIBRES are thoſe ſmall and ſimple filaments, which, by their different diſpoſitions and connections, compoſe all the other parts. Fibres are either membranous, fleſhy, tendinous, or bony, and run in various directions, according to the nature of the parts they form.

(86.) A MEMBRANE is a pliable net-work of fibres interwoven in the ſame plane. Membranes differ in thickneſs, according to the ſmallneſs of their fibres, and number of their planes. Theſe planes are termed *laminæ*, and are diſtinguiſhed according to their ſituation.

(87.) VESSELS are canals, more or leſs flexible, compoſed of different membranes, termed *coats*. Some of them divide into branches, more and more minute, but ſtill remain hollow. The general deſign of the veſſels is to convey fluids.—They are diſtinguiſhed into blood-veſſels, lacteals, lymphatics, &c. The very laſt, and ſmalleſt extremities of theſe are termed *capillaries*. Thoſe veſſels which receive the blood from the heart, and diſtribute it throughout the body, are named *arteries*; thoſe which bring the blood back to the heart, are called *veins*.

(88.) ARTERIES may be diſtinguiſhed from veins in a dead body, by their greater thickneſs, and by their diameter being preſerved when divided, which is not the caſe with a vein.

(89.) NERVES are thoſe white cords which proceed from the cerebrum, cerebellum, and ſpinal marrow, and are ramified over all the parts of the body.

(90.) The ABSORBENTS are a ſyſtem of veſſels, whoſe office is to take up and convey away whatever comes in contact with their mouths or orifices. This ſyſtem conſiſts of the *lacteals* and *lymphatics*.

(91.) MUSCLES are maſſes of red fibres of various lengths. The middle portion of each muſcle is ſaid to be fleſhy. The extremities are called *tendinous*, and thoſe gliſtening, tough, inelaſtic, inſenſible ſubſtances iſſuing from them, *tendons*.

(92.) GLANDS are cluſters, compoſed of blood veſſels and nerves, united together in different folds, contortions, and intertextures, and inveſted by a membranous covering. Their office is to ſeparate from the maſs of blood certain fluids, which they diſcharge either immediately, or by other veſſels, termed *excretory*.

(93.) FAT is an oily ſoft ſubſtance, collected between the ſkin and the muſcles, in the interſtices of the muſcles, about the viſcera, &c. and contained in a fine ſpongy kind of net work, called *cellular membrane*.

(94.) By the term VISCERA, is underſtood parts contained in a great cavity, without being connected to it through their whole extent. Such are the ſtomach, inteſtines, &c. in the abdomen. Other anatomical terms will be explained as they occur.

PART I. OSTEOLOGY.

SECT. I. *Of the* BONES *in general, and their* APPENDAGES.

(95.) Our Almighty Creator evidently deſigned the bones to give ſhape and firmneſs to the human fabric; to form levers for the muſcles to act upon, and to defend thoſe parts from external injury, which are moſt immediately neceſſary to life; as the brain, ſpinal marrow, heart, lungs, &c.—The fibres of a bone, when firſt formed, are very ſoft and gelatinous, until, by the addition of ſolid matter, they grow by degrees to the hardneſs of cartilage, and at length arrive at the ſtate of perfect bone. But this change is neither made in a very ſhort period, nor begun in all the parts of the ſame bone at the ſame time. Flat bones, that have their fibres directed to all ſides, begin to oſſify in or near a middle point; but the cylindrical bones, and all others whoſe fibres are nearly parallel, begin about the middle of each fibre, and thence ſhoot forth to their extremities; not always indeed in continued lines, but frequently beginning new oſſifications, which ſoon join the former; and by the continual addition of this oſſifying matter, the bones increaſe till they become ſufficiently hard.

(96.) The oſſification of bones depends principally on their veſſels being ſo diſpoſed, and of ſuch diameters, as to ſeparate a liquor, which may eaſily turn into a bony ſubſtance, when it is deprived of its thinner parts; as ſeems plain from the obſervation of the callous matter ſeparated after fractures and ulcers, where part of the bone is taken out: For, in theſe caſes, the veſſels extending themſelves, and the liquors added to them, are gradually formed into granulated fleſh; which fills up all the ſpace which the bone is taken from, and then hardens till it becomes as firm as any part of the bone. This happens frequently, even when

when the ends of the diſeaſed bone are at a conſiderable diſtance from each other.

(97.) The induration of bones is alſo greatly aſſiſted by their being expoſed, more than any other parts, to the ſtrong preſſure of the great weights they ſupport, to the violent contraction of the muſcles fixed to them, and to the force of the parts they contain, which endeavour to make way for their own further growth. By all this preſſing force, the ſolid fibres and veſſels of bones are ſtill cloſer, and ſuch particles of the fluids conveyed in theſe veſſels, as are fit to be united to the fibres, are ſooner and more firmly incorporated with them, while the remaining fluids are forcibly driven out by the veins, to be mixed with the maſs of blood. In conſequence of this, the veſſels gradually diminiſh as the bones harden. In old and conſumptive perſons, and ſometimes in diſeaſed or wounded limbs, bones decreaſe as well as the fleſhy parts, though not ſo faſt, becauſe of their hardneſs. Sometimes the oſſifying matter ſhoots out of the bones, and forms bony excreſcences; and frequently in very old men it is depoſited in the coats of the arteries, and renders them incapable of their functions, ſo that they no longer have power to propel the blood, and the extreme parts mortify.

(98.) Though the cartilages and arteries are alſo ſubject to theſe changes, yet no part is exempt from them; for a large portion of the muſcular ſubſtance of the heart itſelf has been found perfectly oſſified. On the other hand, it ſometimes happens, that there is a deficiency of this oſſifying matter. This is evident in ſome fractures, where no callus will form, and conſequently the bone remains diſunited. The ſame thing occurred once in the lower jaw of an adult body; where all that part on one ſide, which is beyond the teeth, was of a ſubſtance between that of a cartilage and a ligament. In children that have died of the rickets, the bones have proved ſoft and ſpongy; and the periofteum in ſome places many times its natural thickneſs; but the cartilages and cartilaginous epiphyſes had no apparent alteration in their texture, though enlarged to more than twice their natural diameters. All cylindrical bones have a large middle cavity, which contains an oily MARROW, and a great number of leſſer cells towards their extremities, which contain a bloody marrow. The marrow is of very conſiderable uſe to the bones; for by entering their tranſverſe canals, and paſſing from them into the longitudinal ones, it is communicated to all the plates to ſoften and connect their fibres, whereby they are preſerved from becoming too brittle; as we ſee they do in burnt bones, or thoſe long expoſed to the air, in people labouring under old age, lues, or ſcurvy. In all which caſes, the oil is either in too little quantity, or has its natural good qualities impaired. Beſides this advantage which the ſubſtance of bones has from the marrow, their articulations are ſaid to receive no leſs benefit from it: for it is thought, that the marrow paſſes into the articular cavities, through the holes which are in the bones near the large joints. And as a proof of this, it is alledged, that butchers, upon ſeeing the greater or leſſer quantity of marrow in the bones of cows, can tell whether they have travelled far or little before they were ſlaughtered.

(99.) Every one of the cells, that contain the marrow, is lined with a fine membrane, and that in the larger cells is alſo contained in thin membranous veſicles. Through the ſubſtance of theſe membranes, to which anatomiſts have given the name of *internal perioſteum*, the blood veſſels are alſo ſpread; their trunks entering obliquely, about the middle of the cylindrical bones. It is from the branches of theſe veſſels that the marrow is ſecreted, while other branches enter the internal ſubſtance of the bones for their nouriſhment; and the reaſon why they enter obliquely is, that they may not weaken the bones by dividing too many fibres in the ſame place. If the bones had been formed of the ſame quantity of matter, without any cavities, they would not, if they were ſtraight, be able to ſuſtain the ſame weight. But being made hollow, their ſtrength to reſiſt breaking tranſverſely is increaſed as much as their diameters are increaſed, without increaſing their weights: a mechaniſm which proves yet more convenient for birds, the bones of whoſe wings, and for the ſame reaſon their quills, have very large cavities. But the bones in the legs of all animals are more ſolid, being formed to ſupport weight; and men's bodies being ſupported by two limbs, the bones of thoſe limbs are therefore made more ſolid than thoſe of quadrupeds. In a fractured bone, in which the ſame kind of matter, that produced bone at firſt, is thrown out from the broken ends, there is formed a maſs of callous matter, of equal ſolidity with any part of the bone, and of equal or greater diameter. Hence the ſtrength of the bone in that place is even greater than it was before: a wiſe proviſion of nature, ſince bones, when once broken, are ſeldom ſet in ſo good a direction as at firſt; and therefore they would be more liable to be broke in the ſame place again, and would be reunited with greater difficulty, or perhaps not at all.

(100.) The firſt objects of conſideration in oſteology, are the body and the extremities of a bone. The ancients gave the name of *diaphyſis* to the body or middle part, and divided the extremities into *apophyſis* and *epiphyſis*. An apophyſis, or *proceſs*, as it is more commonly called, is an eminence continued from the body of the bone, whereas an epiphyſis is at firſt a ſort of an appendage to the bone, by means of an intermediate cartillage. Many epiphyſes, which appear as diſtinct bones in the fœtus, afterwards become apophyſes; for they are at length ſo completely united to the body of the bone as not to be diſtinguiſhable from it in the adult ſtate. It is not unuſual, however, at the age of 18 and even 20 years, to find the extremities of bones ſtill in the ſtate of epiphyſis.

(101.) The names given to the proceſſes of bones are expreſſive of their ſhape, ſize, or uſe; thus if a proceſs is large and of a ſpherical form, it is called *caput*, or *head*; if the head is flatted, it is termed *condyle*. Some proceſſes, from their reſemblance to a ſtiletto, a breaſt, or the beak of a crow, are called *ſtyloid*, *maſtoid*, or *coracoid*; others are ſtyled *ridges* or *ſpines*. The two proceſſes of the os femoris derive their name of *trochanters* from their uſe.

(102.)

(102.) Bones, as already obſerved, have their cavities as well as their proceſſes. Theſe cavities either extend quite through the ſubſtance, or appear only as depreſſions. The former are called *foramina* or *holes*, and theſe foramina are ſometimes termed *canals* or *conduits*, according to their form and extent. Of the depreſſions, ſome are uſeful in articulation. Theſe are called *cotyloid* when they are deep, as is the caſe with the os innominatum, where it receives the head of the os femoris; or *glenoid* when they are ſuperficial, as in the ſcapula, where it receives the os humeri. Of the depreſſions that are not deſigned for articulation, thoſe which have ſmall apertures are called *ſinuſes*; others that are large, and not equally ſurrounded by high brims, are ſtyled *foſſæ*; ſuch as are long and narrow, *furrows*; or if broad and ſuperficial without brims, *ſinuoſities*. Some are called *digital impreſſions*, from their reſemblance to the traces of a finger on ſoft bodies. The bones compoſing the ſkeleton are ſo conſtructed, that the end of every bone is perfectly adapted to the extremity of that with which it is connected, and this connection forms what is called their *articulation*.

(103.) ARTICULATION is divided into *diarthroſis*, *ſynarthroſis*, and *amphiarthroſis*, or moveable, immoveable, and mixed articulation. Each of the two firſt has its ſubdiviſions. Thus the *diarthroſis*, or moveable articulation, includes, 1. the *enarthroſis*, as it is called, when a large head is admitted into a deep cavity, as in the articulation of the os femoris with the os innominatum. 2. *Arthrodia*, when a round head is articulated with a ſuperficial cavity, as is the caſe of the os humeri and ſcapula. 3. *Ginglimus*, or hinge like articulation, as in the connection of the thigh bone with the tibia. The enarthroſis and arthrodia allow of motion to all ſides; the ginglimus only of flexion and extenſion.

(104.) The SYNARTHROSIS, or immoveable articulation, includes, 1. The future, when the two bones are indented into each other, as is the caſe with the parietal bones. 2. Gomphoſis, when one bone is fixed into another, in the manner the teeth are placed in their ſockets.

(105.) The term AMPHIARTHROSIS is applied to thoſe articulations which partake both of the ſynarthroſis and diarthroſis, as is the caſe with the bones of the vertebræ, which are capable of motion in a certain degree, although they are firmly connected together by intermediate cartilages.

(106.) SYMPHYSIS is the union of two bones into one; as in the lower jaw, for inſtance, which in the fœtus conſiſts of two diſtinct bones, but becomes one in a more advanced age, by the oſſification of the uniting cartilage.—When bones are thus joined by the means of cartilages, the union is ſtyled *ſynchondroſis*; when by ligaments *ſyneuroſis*.

(107.) Bones that are not calculated for motion, as thoſe of the ſcull, the oſſa innominata, &c. alſo bones with their epiphyſes, when they meet, preſs into each other, and form *ſutures*, which ſoon diſappear in thoſe that join, while their oſſific matter is ſoft; but thoſe that grow harder before they meet, preſs more rudely into each other, and make more uneven ſutures, ſome of which in the ſcull remain to the greateſt age. It alſo happens ſometimes, that while a bone is oſſifying from its centre, a diſtant part begins a new oſſification, and forms a diſtinct bone, which may happen to be of any figure. Theſe bones are oftenеſt found in the lambdoidal future, and are there called *oſſa triquetra*. But the ends or ſides of bones, that are intended for motion, are hindered from uniting, by the cartilages which cover them; for when theſe cartilages are eroded, the bones very readily unite, and form an anchyloſis.

(108.) The extremities of all thoſe bones that were articulated for very manifeſt motions, or that are not placed againſt other bones, are tipped with *epiphyſes* or additional bones, which in ſome meaſure determine their growth and figure. The epiphyſes are united chiefly to ſuch bones as are deſtined for frequent and violent motion; and for this purpoſe they are wiſely framed of a larger diameter than the bone they belong to. By this means, the ſurface of contact between the two bones of any articulation being increaſed, their conjunction becomes firmer, and the muſcles inſerted into them act with greater force, by reaſon of their axes being further removed from the centre of motion.

(109.) Bones in general are compoſed of a great many plates, each of which is made up of fibres or ſtrings united by ſmaller fibrils; which being irregularly diſpoſed, and interwoven with the other larger fibres, make a reticular work. This texture is plainly ſeen in the bones of fœtuſes, which have not their parts cloſely compacted; and in the bones of adults which have been burnt, long expoſed to the weather, or whoſe compoſition has been looſened by diſeaſes. The chinks, which are generally made according to the directions of the larger fibres of bones, that have undergone the action of fire or of the weather, ſhew the greater ſtrength of theſe, than of the fibres which connect them.

(110.) But although the exterior part of bones is compoſed of firm compact plates, yet they are all more or leſs cavernous internally. In ſome (*e. g.* the thin part of the *ſcapula*) the ſolid ſides are brought ſo near, that little cavity can be ſeen; and in others (*os humeri*, *os femoris*, &c.) the cavities are large and viſible. But the internal ſpongy texture is evident in young animals; and ſome of it may be ſeen in thoſe of the greateſt age. This ſpongy cavernous internal part of bones is generally called their *cancelli*, or *lattice work*.

(111.) All the bones in the human body, except the teeth, and thoſe parts of bones which are covered with cartilage, or where muſcles or ligaments ariſe or are inſerted, are covered with a fine membrane, which upon the ſkull is called *pericranium*, but in all other parts *periоſteum*. It ſerves for the muſcles to ſlide eaſy upon, and to prevent their being lacerated by the rough fibres which compoſe the bones. It is every where full of ſmall blood veſſels, which enter the bones for their nouriſhment; but the internal ſubſtance of the larger bones is nouriſhed by the veſſels, which, as has been already obſerved, enter obliquely through their middle.

(112.) The SYNOVIAL GLANDS are ſmall bodies, ſuppoſed to be of a glandular ſtructure, and exceedingly

exceedingly vascular, secreting a fluid of a clear mucilaginous nature, which serves to lubricate the joints. They are placed in small cavities in the articulations, so as to be capable of being gently compressed by the motion of the joint, which expresses their juice in proportion to the degree of friction. When the synovia is wanting, or is of too thick a consistence, the joint becomes stiff, and incapable of flexion or extension. This is what is termed *anchylosis*.

(113.) The LIGAMENTS of the JOINTS are either *round* or *bursal*. The round ligaments are white, tendinous, and inelastic. They are strong, flexible, and are found only in the joint of the knee, and in the articulation of the os femoris with the os innominatum. The bursal, or capsular ligaments, surround the whole joint like a purse, and are to be found in the articulations which allow motion every way, as in the articulation of the arm with the scapula.

(114.) A few of those sacs, called BURSÆ MUCOSÆ, were known to former anatomists, but by much the greater number have been since discovered by Dr Monro, who observes, that they are to be met with in the extremities of the body only; that many of them are placed entirely on the inner sides of the tendons, between these and the bones. Many others cover not only the inner, but the outer sides of the tendons, or are interposed between the tendons and external parts, as well as between those and the bones. A few such sacs are observed where the processes of bones play upon the ligament, or where one bone plays upon another. Their proper membrane is thin and transparent, but very dense, and capable of confining air or any other fluid. It is joined to the neighbouring parts by the common cellular substance. Between the bursa and the hard substance of a bone, a thin layer of cartilage or of tough membrane is very generally interposed. To the cellular substance on the outside of the bursa, the adipose substance is connected; except where the bursa covers a tendon, cartilage, or bone, much exposed to pressure or friction. In several places a mass of fat, covered with the continuation of the membrane of the bursa, projects into its cavity. The edges of this are divided into fringes. The inner side of the membrane is smooth, and is extremely slippery from the liquor secreted in it. The structure of the bursæ bears a strong resemblance to the capsular ligaments of the joints.

(115.) It would be improper to conclude this section without mentioning the SKELETON. This word σκελετος, which by its etymology implies simply a dry preparation, is usually applied to an assemblage of all the bones of an animal united together in their natural order. It is said to be a natural skeleton, when the bones are connected together by their own proper ligaments; and an artificial one, when they are joined by any other substance, as wire, &c. The skeleton is generally divided into the head, trunk, and extremities. The first division includes the bones of the cranium and face. The bones of the trunk are the spine, ribs, sternum, and bones of the pelvis. The upper extremity on each side consists of the two bones of the shoulder, viz. the scapula and clavicle; the bone of the arm or os humeri; the bones of the fore-arm, and those of the hand. The lower extremity on each side of the trunk consists of the thigh bone and the bones of the leg and foot.

SECT. II. *Of the* SUTURES *and* BONES *of the* CRANIUM.

(116.) The mutual indentation of one bone with another, forms what is called a SUTURE. Those which have proper names we shall describe; those which have not, will be found to derive their names from the bones which they surround. 1. The *coronal future* runs across the skull, from one upper edge of the sphenoidal bone to the other, and joins the parietal to the frontal bones. 2. The *sagittal future* joins the parietal bones; begins at the os occipitis, and is continued to the os frontis. In children it descends to the nose, the os frontis in them being two bones; and sometimes it is found in adult subjects. 3. The *lambdoidal future* joins the back part of the ossa bregmatis, or parietal bones, to the upper part of the occipital. In this future are frequently observed small bones called ossa triquetra, and sometimes they occur in other futures. 4. The *squamous future* is formed by the upper part of the temporal and sphenoidal bones wrapping over the lower edges of the parietal bones. 5. The *transverse future* runs across the face through the bottoms of the orbits of the eyes. It joins the lower edge of the frontal bones to the os sphenoides, maxillæ superioris, ossa nasi, unguis, plana, palati, and malarum.

(117.) An evident advantage, arising from the skull being divided into so many bones is, that it is neither so liable to be fractured, nor to have fractures extended so far as would happen were it composed of one bone only. This structure is also convenient to the process of ossification, as has been already shewn; and it is still more important to infants in the birth, because these bones not being perfect at that time, admit of being pressed together, so as to make the head conform to the shape and dimensions of the parts through which it is to pass.

(118.) Ten of the bones of the head compose the CRANIUM, the use of which is, to contain the brain, and defend it from external injuries. These bones merit particular description.

(119.) 1. &c. 2. The OSSA PARIETARIA are two large bones which compose the superior and lateral parts of the skull. On their inside they are remarkably imprinted by the arteries of the dura mater, exhibiting somewhat the appearance of the branches of a tree.

(120.) 3. The OS FRONTIS forms the upper and fore part of the cranium. Its inferior parts compose the superior portions of the orbit of the eyes, where, on its insides, are impressed the valvuli of the brain. In its middle above the os ethmoides usually arises a thin spine, which strengthens that part of the bone, it being otherwise weak from its flatness. In some skulls this spine is wanting; but then the bone is usually thicker in that place, and from its middle, externally, goes a process which supports the bones of the nose. Immediately above the os eth-

moides in this bone is a ſmall blind hole, through which runs a vein into the beginning of the longitudinal ſinus of the dura mater; and on the upper edge of each orbit, a ſmall perforation, or notch, through which nerves and an artery paſs to the forehead: it has alſo a ſmall hole in each orbit, near the os planum, through which paſſes a branch of the fifth pair of nerves. In the ſubſtance of this bone near the noſe are two, three, four, and ſometimes five ſinuſes, which open into the noſe; they differ very much in different perſons, and are very rarely found in children. Thoſe ſinuſes, and the ſpine in this bone, make it very dangerous, if not impracticable, to apply a trephine on the middle and lower part of the fore-head.

(121.) 4. The Os ETHMOIDES, or *ſieve-like bone*, is about two inches in circumference, and is ſealed in the anterior part of the baſis of the ſkull, being almoſt ſurrounded by the bone laſt deſcribed. It is pierced with a number of holes, through which the olfactory nerves paſs. From its middle ariſes a large proceſs named criſta galli; and oppoſite to this a thin one which in part divides the noſe. The greater part of the laminæ ſpongioſæ in the noſe belong to this bone.

(122.) 5. The Os SPHENOIDES is of ſo very irregular a ſhape as ſcarcely to allow of verbal deſcription. It is ſeated in the middle of the baſis of the ſkull, and is bounded by the os frontis, ethmoides, vomer, occipitis, maxillæ ſuperioris, oſſa parietalia, palati, malarum, temporum, and petroſa, which are parts of the former bones. In its infide, next the brain, is a cavity named cella turcica, which is bounded by four proceſſes called clinoides; under the two foremoſt of which paſs the internal carotid arteries, and from their outſides are continued two thin long proceſſes upon that part of the frontal bone, which ſeparates the anterior lobes of the brain from the poſterior. Oppoſite to the cella turcica is a proceſs which makes part of the ſeptum narium. On the outſide of the ſkull adjoining to the upper jaw, are two proceſſes of this bone on each ſide, named pterygoides, from which ariſe one on each ſide near the palate, which have no name. Over theſe paſs the tendons of the pterygoſtaphalina externi muſcles; and nearer towards the occiput, between theſe and the ſtyloid proceſſes of the oſſa petroſa, ariſe two more ſmall rugged proceſſes. Under the cella turcica, in this bone, is a ſinus or two, moſtly found in adults, but in children, conſiſting only of ſuch a ſpongy ſubſtance as is ſeen in the ends of ſome of the bones. According to ſome writers, this ſinus belongs properly to the os ethmoides. At the infide of the baſis of the two anterior clinoid proceſſes are two round holes, which are the firſt foramina of the ſkull; through theſe the optic nerves paſs. Almoſt under theſe, towards the ſides of the ſkull, are two irregular ſlits, named foramina lacera, or the ſecond foramina of the ſkull, through which paſs nerves and blood veſſels into the orbits of the eyes. Under theſe again, towards the occiput, are two round holes, which make the third foramina, and through which paſs nerves to the face. About half an inch nearer the occiput are two more, of an oval figure, which are the fourth foramina, and through which paſs the largeſt branches of the fifth pair of nerves. A ſtraw's breadth farther are two very ſmall ones, called the fifth foramina, through which thoſe branches of the carotid arteries enter that are beſtowed upon the dura mater. Between this laſt deſcribed bone and the oſſa petroſa are two large rough holes, in which are ſometimes ſeen large veins; and from theſe holes, through part of the os ſphenoides, under the pterygoid proceſſes proceed the ſmall apertures, through which paſs arteries to the back part of the noſe.

(123.) 6 & 7. The two OSSA TEMPORUM are ſituated below the parietal bones, at the middle and lower parts of the ſides of the ſcull. They have each, at their back parts, one large ſpongy proceſs called mammillaris, or maſtoideus; and from the lower and middle parts of each, a proceſs iſſues, which joins the oſſa malarum, and which is named *zygomalis* or *zygomaticus*.

(124.) 8 & 9. The two OSSA PETROSA lie between the former bones and the occipital bones, or rather are portions of the former, as they are never found ſeparate in adult bodies. Each on its outſide has one long ſlender proceſs called ſtyliformis, and near the ſide of this proceſs a foramen, running obliquely forwards into the ſcull, and through which the carotid arteries paſs to the brain. Theſe are the ſixth foramina, and two foramina in the infide of the ſcull leading to the organs of hearing, which are the ſeventh foramina. The ridges on the upper parts of each of theſe bones help to keep the brain ſteady, and are ſtrong ſupports to the thin and flat parts of the ſcull. What remains to be ſaid of this bone belongs properly to the deſcription of the organs of hearing, to which we refer. Between the laſt deſcribed bones and the following bone are two large holes, which are the 8th foramina. Through theſe paſs the 8th pair of nerves and the lateral ſinuſes. Sometimes there are two on each ſide, one for the nerve and one for the ſinus. To theſe foramina we may add another very ſmall one on each ſide, through which paſs the *portiones duræ* of the auditory nerves; and ſometimes there is another for the paſſage of an artery.

(125.) 10. The Os OCCIPITIS forms all the back part of the ſcull. It is bounded by the ſphenoidal, temporal, petroſal, and parietal bones. It has two ſmall apophyſes, by which it is articulated to the ſpine. Near thoſe apophyſes are two ſmall foramina, which are the ninth of the ſcull; and through them paſs the ninth pair of nerves. Between theſe is the great or tenth foramen, through which the medulla oblongata deſcends into the ſpine, the cervical arteries enter, and the cervical veins paſs out. In the infide of this bone is a cruciat ſpine impreſſed by the longitudinal and lateral ſinuſes; and on the outſide, oppoſite to the middle of this ſpine, in ſome bodies, is an apophyſis, and from that down to the great foramen a ſmall thin ſpine. The ſpines in this bone are of the ſame uſe with thoſe in the os frontis and other bones, viz. to ſtrengthen it. The thinner parts of this bone are alſo defended by the muſcles that cover them; a kind of proviſion which is very neceſſary, ſince we can leaſt defend this part, and blows here are often attended with the moſt fatal conſequences. There exiſts in moſt

ſculls

ſculls a foramen behind each apophyſis of the occipital bone. Through theſe paſs ſinuſes from the lateral ſinuſes to the external cervical veins: and by means of theſe paſſages, as in all other communications of the ſame ſort, the blood paſſes from thoſe that happen to be ſurcharged by any poſture of the head, into thoſe that from the ſame poſture would have been almoſt empty. Such ſculls as want theſe foramina have two ſinuſes which anſwer the ſame purpoſe. Any perſon acquainted with each bone of the cranium, can, without difficulty, examine them as they ſtand united, ſo as to know the ſhapes, ſizes, diſtances, &c. of their ſeveral parts, and the forms, capacities, &c. of the cavities formed by them. This is of great uſe towards underſtanding the anatomy of the parts contiguous to, contained within, or connected with them.

SECT. III. *Of the* BONES *of the* FACE, *and* MOUTH.

(116.) THE face is that irregular pile of bones which compoſe the fore and under part of the head. Theſe are divided by authors into the *upper* and *lower maxillæ*, or jaws. The upper jaw conſiſts of 13 bones, excluſive of the teeth. Of theſe 6 are placed on each ſide of the maxilla ſuperior, and one in the middle. The bones, which are in pairs, are the oſſa naſi, oſſa malarum, oſſa unguis, oſſa maxillaria, oſſa palati, and oſſa ſpongioſa inferiora. The ſingle bone is the vomer.

(117.) 1. The OSSA NASI make the upper part of the noſe, and form that kind of arch, which is fitteſt to ſuſtain ſuch injuries as the noſe is moſt expoſed to, as blows, bruiſes, &c.

(118.) 2. The OSSA MALARUM compoſe the anterior, lower, and outer parts of the orbits of the eyes. They have each a ſhort proceſs, which proceſs joins the proceſſus jugales of the temporal bones, and form arches which have been called oſſa jugalia.

(119.) 3. OSSA UNGUIS are ſituated immediately below the os frontis towards the noſe, and within the orbits of the eyes, whoſe anterior and inner parts they help to compoſe. Between each of theſe and the upper jaw is a foramen as large as a gooſe quill, for the paſſage of the lachrymal duct into the noſe. Through this the puncta lachrymalia carry off any ſuperfluous moiſture from the eyes.

(120.) 4. The OS MAXILLARE SUPERIOR is often deſcribed as ſingle, though it evidently conſiſts of two bones joined by a ſuture, which is ſcarce ever obliterated. It has two proceſſes, which join the os frontis, and make part of the noſe; and a third, which joins to the cartilage of the ſeptum naſi. Its upper and outer parts compoſe the lower portions of the orbits of the eyes; its lower ſide, all that part of the face under the cheeks, eyes, and noſe to the mouth, and two thirds of the roof of the mouth. A little below the orbits of the eyes, in this bone, are two holes, and behind the dentes inciſores one more, which divides into two, as it opens into the noſe, on each ſide of the ſeptum naſi. Between the poſterior grinding teeth and the orbits of the eyes are two great ſinuſes, called, antra maxillæ ſuperioris, which open in the upper part of the noſe. In the lower edge of this jaw are the alveoli, or ſockets for the teeth. All the body of the maxillary bone is hollow, and leaves a large ſinus, which is commonly called antrum highmorianum. When the os maxillare is ſeparated from all the other bones of the ſkeleton, its antrum appears to have a large aperture into the noſtrils; but, in a recent ſubject, it is ſo covered at its back part by the palate bone, in the middle by the os ſpongioſum inferius, and before by a ſtrong membrane; that one or ſometimes two holes, ſcarcely ſo large as a crow quill, are only left at the upper part; which, after a ſhort winding proceſs, open into the noſtrils between the two oſſa ſpongioſa. At the bottom of this cavity, we may often obſerve ſome protuberances, in which the ſmall points of the roots of the teeth are contained. This cavern and the ſockets of the teeth are often divided by the interpoſition of only a very thin bony plate, which is liable to be eroded by matter, or to be broke in drawing a tooth.

(131.) 5. The OSSA PALATI are two ſmall bones that form the back part of the roof of the mouth, and a ſmall part of the bottom of each orbit. Between the oſſa palati and os maxillare, near the pterygoid proceſſes of the ſpheroidal bone, are two ſmall foramina, through which arteries and nerves paſs to the palate.

(132.) 6. The OS SPONGIOSUM is uſually treated as a diſtinct bone, though it is only the ſpongy lamina in the noſe, of the os ethmoides and oſſa plana, but chiefly of the os ethmoides, to which it uſually adheres. The OSSA TURBINATA, or SPONGIOSA INFERIORA, reſemble the ſuperior oſſa ſpongioſa in ſhape and ſubſtance, but have their anterior and upper edges contiguous to the tranſverſe ridges of the naſal proceſſes of the maxillary and palate bones. From their upper ſtraight edge, two ſmall proceſſes ſtand out; the poſterior, which is the broadeſt, deſcends to cover ſome of the antrum highmorianum; the anterior riſes up to join the os unguis, and to make part of the lachrymal duct.

(133.) 7. The VOMER, ſo called from its reſemblance to a *plow-ſhare*, is ſeated between the bones of the palate, and the ſphenoidal bone. It is alſo joined to the proceſs of the ethmoides, and part of the lower jaw. Its fore part is ſpongy, and is continued to the middle cartilage of the noſe. This bone and cartilage form the *ſeptum naſi*.

(134.) 8. The OSSA PLANA are ſeated immediately beyond the foregoing bones, in the orbits of the eyes, and are near thrice as big. They are rather ſmooth ſurfaces of the os ſpongioſum, than diſtinct bones, and are very often imperfect.

(135.) 9. The MAXILLA INFERIOR, or *Lower Jaw*, is articulated with looſe cartilages to the temporal bones, by two proceſſes, named condyloides. Near theſe ariſe two more, called coronales, and at the inſide of the chin a ſmall rough proceſſus innominatus. In the inſide of this bone under each proceſſus coronalis, is a large foramen, which runs under the teeth, and paſſes out near the chin. Through this foramen, the veſſels paſs that belong to the teeth; and in the upper edge of this jaw are the ALVEOLI or ſockets for the TEETH, which ſeldom exceed 6 in each jaw. The 4 firſt

in each are called *inciſores*, the two next *canini*, the reſt *molares*. The 4 laſt of theſe are named *dantes ſapientiæ*, becauſe they do not appear till men arrive at years of diſcretion. The inciſores and canini have only one ſingle root, but the molares more; the eight firſt, two; and the reſt, ſome 3, ſome 4, eſpecially in the upper jaw; where alſo they are ſpread wider, becauſe that jaw being more ſpongy than the other, the teeth need more ſpace to fix them. Each of theſe roots has a foramen, through which paſs an artery, vein, and nerve, which are expanded in a fine membrane that lines the cavity in each tooth. Theſe veſſels and membrane are the ſeat of the *tooth-ach*. The teeth of children caſt off in conſequence of the preſſure of the new teeth, which cauſes the roots of the firſt teeth to be abſorbed. When teeth are drawn from the jaws of adult perſons, the ſockets are abſorbed, and new teeth very rarely, if ever ſupply the place of thoſe that have been extracted. All the teeth are covered, above the ſocket, with a very hard, white vitreous ſubſtance called *enamel*, which is equally uſeful and ornamental. It is thickeſt on the grinding ſurface, and becoming gradually thinner terminates inſenſibly at the neck of the tooth. It ſerves to preſerve the teeth, and while the enamel remains ſound there is no danger of *tooth-ach*; but when once it is broken or injured, it is impoſſible to reſtore it.

(136.) We cannot cloſe this ſection without taking notice of the Os HYOIDES, which, though it is not one of the bones of the *face*, cannot be ranked any where ſo properly, as after the bones of the *mouth*. It is placed at the root of the tongue, and was ſo called by the ancients, on account of its ſuppoſed reſemblance to the Greek letter υ. The body, which is the middle and broadeſt part of the bone, is ſo placed that it may be eaſily felt at the fore part of the throat. Anteriorly it is irregularly convex, and its inner ſurface is unequally concave. Its cornua, or horns, which are flat and a little bent, being much longer than the body, may be deſcribed as forming the ſides of the υ. The appendices, or little horns, are two proceſſes which riſe up from the articulations of the cornua with the body, and are uſually connected with the ſtyloid proceſs on each ſide by means of a ligament. The uſes of this bone are to ſupport the tongue, and afford attachment to a great number of muſcles; ſome of which perform the motions of the tongue, while others act on the larynx and fauces.

SECT. IV. *Of the* BONES *of the* TRUNK.

(137.) THE TRUNK conſiſts of the *ſpine*, *pelvis*, and *thorax*. 1. The SPINE is compoſed of 24 vertebræ, beſides thoſe of the os ſacrum and coccygis. Seven of theſe belong to the neck, and the firſt of them is called *atlas*, becauſe it immediately ſupports the head. Its upper ſide has two cavities, into which the apophyſes of the os occipitis are received; but theſe two cavities together, unlike all other joints, are laterally portions of concentric circles, by which means they are but as one joint, and ſo ſuffer the head to move eaſily ſide ways, which otherwiſe it could no more do than the knee, which alſo has two heads and two cavities. The under ſide of this bone has a very flat articulation with the next; by which means it is fitted for a rotatory motion. The ſecond vertebra is called *dentata*, or axis, from a proceſs which paſſes through the former bone, and is the axis upon which it turns; nevertheleſs all the vertebræ of the neck contribute ſomething to the rotatory motion of the head. The *proceſſus dentatus* is ſtrongly tied to the os occipitis, and to the atlas by ligaments, to prevent its hurting the ſpinal marrow. Of the vertebræ 12 belong to the back, and 5 to the loins. The os ſacrum conſiſts ſometimes of 5, ſometimes of 6 bones, and the os coccygis of 4. If the ſpine had been compoſed of fewer bones, they muſt have either not been capable of bending ſo much and ſo variouſly as they do, or have bent more in each joint, which would have endangered the ſpinal marrow, that runs through them.

(138.) The ſuperior VERTEBRÆ of the neck being fixed behind the head's centre of gravity, the neck is ſo far bent forward, as that the laſt of theſe vertebræ, which has a firm bearing upon thoſe of the thorax, falls exactly under the centre of gravity. Thoſe of the thorax are bent backwards, behind the centre of motion, to make room for the parts contained in the thorax; and that they might not be made too weak by this ſtructure, they are formed for leſs motion than the other vertebræ. Thoſe in particular which are bent fartheſt from the centre of gravity have the leaſt motion. The middle vertebræ of the loins are again bent forwards under the centre of gravity, or near it; and from thence they go backward to the os ſacrum, where being fixed to the oſſa innominata behind the centre of gravity, the articulation is therefore firm and without motion; and from thence the oſſa innominata are ſo formed, as that their ſockets, into which the thigh bones are admitted and enjoy a free motion, are exactly under the centre of gravity.

(139.) In all theſe vertebræ, except the firſt, there is a middle anterior ſpongy body, by which they are firmly articulated with a very ſtrong intervening ligament; from the middle of the hind part of each, except the firſt, ſtands a proceſs named *ſpinalis*; and from every one a proceſs on each ſide, called *tranſverſalis*, and two ſuperior, and two inferior ſhort ones, by which the back parts of the vertebræ are articulated, named *obliqui ſuperiores*, and *inferiores*. The fore-part of the 7 vertebræ of the neck, and two upper of the back, are flat forwards, to make room for the trachea. The third and fourth of the back are acute, to give way to the veſſels of the lungs and heart, and they are directed to the right ſide for the better ſituation of the heart, which makes that ſide of the breaſt more convex than the other. The ſpinal proceſſes of the 2d, 3d, 4th, and 5th vertebræ of the neck are forked; the two laſt long and horizontal, the three or four upper ones of the back like them, only a little declining. The middle ones of the back run obliquely downwards, and the proceſſes of the remaining vertebræ become ſucceſſively thicker, ſtronger, and leſs declining; thoſe of the loins being horizontal, like the laſt of the neck. The muſcles, that are inſerted into the ſpinal proceſſes of the vertebræ of the

the neck and loins act with more ſtrength than thoſe of the back, becauſe their proceſſes being perpendicular to the ſpine, they are longer levers. Beſides, thoſe of the back almoſt touch one another, to prevent much motion, becauſe it would interrupt reſpiration; but more motion being neceſſary in the neck and loins, their proceſſes are contrived accordingly. The tranſverſe proceſſes of the vertebræ of the neck are perforated, for the admiſſion of the cervical blood veſſels, and bowed downwards, and hollowed, for the paſſage of the cervical nerves. The eight or nine upper ones of the back receive the upper ribs; and the reſt, with thoſe of the loins, ſerve only for the origin and inſertion of muſcles.

(140.) 2. The Os SACRUM has two upper oblique proceſſes, ſome ſmall ſpinal proceſſes, and two foramina in each interſtice of the bones which compoſe it, both before and behind.

(141.) 3. The Os COCCYGIS, or *rump-bone*, is that triangular chain of bones depending from the os ſacrum; each bone becoming ſmaller as they deſcend, till the laſt ends almoſt in a point. The os coccygis is convex behind, and concave before; from which crooked pyramidal figure, which was thought to reſemble a cuckow's beak, it has got it's name. This bone conſiſts of four pieces in people of middle age. In children, almoſt the whole of it is cartilage. In old ſubjects, all the bones are united, and become frequently one continued bone with the os ſacrum.

(142.) There is a large foramen through every bone of the ſpine, the oſſa coccygis excepted. Theſe foramina together make a channel through the ſpine, deſigned to contain the medulla ſpinalis; and in each ſpace between the vertebræ are two large holes for the nerves to paſs out. Nothing can be more worthy of admiration, than the proviſion made to prevent luxations in this chain of bones, ſuch luxations being worſe than any other, becauſe of the ſpinal marrow that is contained within. The bodies of the vertebræ are all in the ſame manner connected by ſtrong intervening ligaments or cartilages. In the neck the oblique proceſſes of the received bone are wrapped over thoſe of the receiving bone, which forbids their luxating forwards. The tranſverſe proceſſes, with a ſmall apophyſis of the body of the ſame bone, in like manner, ſecure them from ſlipping backwards; and an apophyſis on each ſide of the body of the receiving bone, hinders them from ſlipping to either ſide. The vertebræ of the back are hindered from diſlocating forwards by the ſame proviſion with thoſe of the neck; and from luxating backwards, by the ribs which are faſtened to the tranſverſe proceſſes of the inferior vertebræ, and againſt the back part of the body of the next ſuperior. They alſo hinder them from diſlocating to either ſide; but the laſt ribs are not fixed to the tranſverſe proceſſes of the vertebræ of the back, and therefore it is that luxations are moſt frequently ſeen in this part. The vertebræ of the loins, however, are received into deep cavities, and are tied with much ſtronger ligaments for their ſecurity. Each joint of the vertebræ, except the two uppermoſt, has two centres of motion, one upon the bodies of the vertebræ, when the trunk is bowed forward; and the other at the articulations of the oblique proceſſes, when the body is inclined backwards. From this ſtructure the extenſor muſcles have about twice the lever to act with, and conſequently twice the power to raiſe the trunk into an erect poſture, that they have to carry it beyond that poſture; for then the oblique proceſſes begin to be the centre of motion, and give a like advantage to the flexors. Without this contrivance it would be difficult to keep the body erect, or to recover an erect poſture after the body has been bent forwards.

(143.) 4. The RIBS are 24 in number on each ſide. The ſeven uppermoſt are called *true* ribs, becauſe their cartilages reach the ſternum; and the five loweſt are named *falſe* ribs. They are articulated to the twelve vertebræ of the back, and all, except the two or three laſt, are articulated to their tranſverſe proceſſes, and the under ſide of the middle ribs are hollowed for the paſſage of the intercoſtal veſſels. They defend the parts contained in the breaſt, and when they are drawn upwards, the cavity of the breaſt is enlarged for inſpiration, and vice verſa. The ſubſtance of the ribs is ſpongy, cellular, and only covered with a very thin external lamellated ſurface, which increaſes in thickneſs and ſtrength as it approaches the vertebræ. To the fore end of each rib a long, broad, and ſtrong cartilage is fixed, and reaches thence to the ſternum, or is joined to the cartilage of the next rib. This courſe, however, is not in a ſtraight line with the rib; for the cartilages generally make a conſiderable curve, the concave part of which is upwards; therefore, at their inſertion into the ſternum, they make an obtuſe angle above, and an acute one below. Theſe cartilages are of ſuch a length as never to allow the ribs to come to a right angle with the ſpine; but they keep them ſituated ſo obliquely as to make the angle very conſiderably obtuſe, above, till a force exceeding the elaſticity of the cartilage is applied. Theſe cartilages, like all others, are firmer and harder internally than they are on their external ſurface; and ſometimes in old people, all their middle ſubſtance becomes bony, while a thin cartilaginous lamella appears externally. The oſſification, however, begins frequently at the external ſurface.

(144.) 5. The STERNUM, or *breaſt-bone* is generally made up of three ſpongy bones, ſometimes more. To this the two ribs are articulated by their cartilages, which ſometimes in robuſt men have moveable joints, ſuch as are ſeen in oxen and other quadrupeds. At the end of the ſternum is the *cartilago enſiformis*, ſo called from its ſhape, (the form of a ſword,) but it is very often double. There is alſo frequently a variety in the form of the cartilages which join the ribs and ſternum; ſometimes one cartilage ſerving two ribs, and ſometimes a cartilage not being joined to any rib. It is ſeldom that we find fewer than 24 vertebræ in the ſpine, beſides the os ſacrum, but often more. Sometimes there are 13 of the back, with as many ribs on each ſide: ſometimes there exiſt 6 in the loins, and in ſome bodies 2 ribs from the firſt vertebræ of the loins; but then the tranſverſe proceſſes are generally wanting.

(145.) 6. The bone called OS INNOMINATUM, or

the *un-named bone*, in the adult ſubject, is in young perſons compoſed of three bones; the upper named *os ilium*, the lower and poſterior *os iſchii*, and the anterior *os pubis*. The upper edge of the ilium is called its ſpine, the anterior part of the ſpine its *apex*, and a little lower the *proceſſus innominatus*. The os ilium has two proceſſes, the one named the obtuſe proceſs, and the other the acute. In the centre of theſe bones is the *acetabulum* or ſocket in which the motions of the thigh bone are performed. In the bottom of this ſocket is another cavity, in which lies the lubricating gland which ſupplies this joint with *ſynovia*. Between the os iſchium and pubis a very large irregular hole is left, which, from its reſemblance to a door or ſhield, has been called *thyroides*. This hole is all, except the niche for the poſterior crural nerve, filled up, in a recent ſubject, with a ſtrong ligamentous membrane, that adheres very firmly to its circumference. From this membrane chiefly the two obturator muſcles external and internal, take their riſe. The great deſign of this hole, beſides rendering the bone lighter, is to allow a ſtrong enough origin to the obturator muſcles, and ſufficient ſpace for lodging their bellies; that there may be no danger of diſturbing the functions of the contained viſcera of the pelvis, by the action of the internal, nor of the external being bruiſed by the thigh bone, eſpecially by its leſſer trochanter.

SECT. V. *Of the* BONES *of the* UPPER EXTREMITY.

(146.) THE upper extremity conſiſts of the SHOULDER, the ARM, and the HAND. 1. In deſcribing theſe we ſhall begin with the CLAVICULA or *collar-bone*, which is connected at one end to the ſternum, by a looſe cartilage, and at the other to the proceſſus acromion of the ſcapula; at a ſufficient diſtance from the breaſt, to prevent the ſhoulders from coming too near together.

(147.) 2. The SCAPULA is united to the ſternum by the clavicle. Its chief connection however is to the ribs and ſpine, by means of the ſame muſcles that direct its motions. In ſuch quadrupeds as have no clavicles, it is fixed only by muſcles, whoſe actions give to this bone a great deal of that motion which ſeems to belong to the joint of the ſhoulder. The under ſide of this bone is a little concave, partly to fit the outer ſurface of the ribs on which it moves, and partly to give room for the ſubſcapularis muſcle. On the outſide of the ſcapula riſes a large ſpine, the fore part of which is called *proceſſus acromion* and to which the clavicle is fixed. In men and ſuch quadrupeds as have clavicles, and uſe their fore limbs like arms, this proceſs and ſpine are much larger and more prominent. By this the muſcles are placed farther from the centre of motion, and are thereby able to act with greater effect. Near this proceſs is another called *coracoides*, from whoſe extremity and with ſimilar advantages, ariſe two muſcles of the arm. This proceſs with the former, and a flat ligament between them both, hinder the os humeri from being diſlocated upwards. The ſide oppoſite to the ſocket is called the baſis of the ſcapula, and the lower edge *coſta inferior* from its figure, which is thick and like a rib to the ſcapula; but its upper edge being very thin, is improperly ſo called in the human ſubject, although it may be otherwiſe in many quadrupeds. All the fore part of this edge, cloſe to the coracoid proceſs, is a ſemicircular niche or groove for the paſſage of blood-veſſels, which niche is cloſed above with a ligament and ſometimes with bone. The ſcapula and clavicle are joined by plain ſurfaces tipped with cartilage. The ſcapula is connected to the head, os hyoides, vertebræ, ribs, and arm bone, by muſcles, that have one end faſtened to theſe bones, and the other to the ſcapula, ſo as to move it upwards, downwards, backwards, or forwards; by the quick ſucceſſion of theſe motions, its whole body is carried in a circle. But being alſo often moved as upon an axis perpendicular to its plane, its circumference turns in a circle whoſe centre this axis is. Whichever of theſe motions it performs, it always carries the outer end of the clavicle and the arm along with it.

(148.) The ARM is divided into two parts, which are articulated with each other at the elbow, viz. The arm properly ſo called and the fore arm. The arm conſiſts of one bone, viz. The OS HUMERI, which at its upper end or head, where it is joined to the ſcapula, is ſomewhat flat, and much larger than the ſocket which receives it. At its ſuperior part are two proceſſes for the inſertion of the muſcles of the arms, and between theſe proceſſes is a long channel, in which lies the tendon of the biceps cubiti. At its lower end are two conſiderable proceſſes, both formed to give origin to muſcles which move the wriſt and fingers; and the flexors in theſe parts being much more conſiderable than the extenſors, the inner proceſs from which the flexors ariſe is formed much larger than the outer, from which the extenſors take their origin; between theſe proceſſes is the elbow joint. That part to which is attached the upper end of the radius, is fitted not only for the motion of the elbow, but alſo for the rotatory motion of the radius. The reſt of this joint is made of portions of unequal, but concentric, circles, like the ſhanks of quadrupeds; and this inequality prevents the ulna from diſlocating ſideways, which ſo ſmall a joint with ſo conſiderable a ſhare of motion would otherwiſe be very liable to. Of a like uſe is the little ſinus on the fore part of the humerus, and the large one behind; the firſt receiving a proceſs of the ulna when the arm is bent, and the other, the olecranon, when the arm is in a ſtate of extenſion.

(149.) The fore arm conſiſts of two bones, viz. the Ulna and Radius. The ULNA, at its upper end, has one large proceſs called *olecranon*, and a ſmall proceſs on the fore part; and on one ſide between theſe is alſo a ſmall cavity, which receives the upper end of the radius for its rotatory motion. Down the ſide of this bone, next the radius, is a ſharp edge, from which the ligament ariſes, which connects both together. At the lower end is a proceſs, called *ſtyliformis*, and a round head, which is received into the radius and adapted for the rotatory motion of the elbow.

(150.) The upper end of the RADIUS is received into the ulna, and joined to the humerus, in a manner chiefly favourable to its rotatory motion; for the ſtrength of the elbow joint receives but little

little advantage from the union of theſe two bones A little below its head is a large tubercle, into which the biceps muſcle is inſerted, and which, in conſequence of this arrangement, turns the cubit in a ſpine poſture, and alſo bends it. At the lower end, which is thicker, is a ſocket to receive the carpus and at the ſide next the ulna a ſmall one to receive that bone. There is likewiſe a thin edge, into which the tranſverſe ligament, which ariſes from the ulna, is inſerted. By this ligament theſe bones are tied conveniently and firmly together; for the ulna being chiefly articulated to the os humeri, and the radius to the carpus, a weight at the end would be apt to pull theſe bones aſunder were it not prevented by this ligament.

(151.) Each HAND has no fewer than 27 bones, viz. thoſe of the carpus, metacarpus, and fingers. This multiplicity of bones in the hands is eſſential to the various motions we have occaſion to make. If each finger, for inſtance, were compoſed of only *one* bone inſtead of *three*, it would be impoſſible for us to graſp any thing.

(152.) I. The CARPUS or *wriſt* conſiſts of 8 ſmall bones of very irregular forms, but undoubtedly the propereſt, that can be. They have all obſcure motions one with another, and with thoſe of the *metacarpus*: but the motion of thoſe of the firſt rank, or order, with thoſe of the ſecond, is more conſiderable, and is directed by the ſame muſcles which move the carpus on the radius. Thoſe of the upper row are named, from their figures, *os naviculare*, *os lunare*, *os cuneiforme*, and *os piſiforme*; thoſe of the ſecond row, *os trapezium*, *os magnum*, *os trapezoides*, and *os unciforme*. All thoſe bones are convex towards the back and ſlightly concave towards the palm of the hand. Their articulating ſurfaces are covered with cartilages and ſecured by many ſtrong ligaments.

(153.) II. The METACARPUS conſiſts of 4 bones which ſuſtain the fingers; that of the fore-finger having the leaſt motion, and that of the little one the moſt. The other ends of theſe bones have round heads for the articulations of the fingers; but the other joints of the fingers have double heads and ſockets. The thumb is ſhorter and ſtronger than any of the fingers, becauſe in its actions it has to reſiſt them all. The firſt joint is very ſingular, each bone equally receiving and being received.

(154.) III. The regular diſpoſition of the bones of the FINGERS into three rows, has made them generally obtain the name of three *phalanges*. All of them have half-round convex ſurfaces, covered with an aponeuroſis, formed by the tendons of the extenſors, lumbricalle and interoſſei, and placed directly backwards, for their greater ſtrength: and their flat concave part is forwards, for taking hold more ſurely, and for lodging the tendons of the flexor muſcles. The ligaments for keeping down theſe tendons are fixed to the angles that are between the convex and concave ſides.

SECT. VI. *Of the* BONES *of the* LOWER EXTREMITY.

(155.) EACH of the lower extremities is divided into four parts, viz. the *os Femoris*, or thigh bone; the *rotula*, or knee bone: the *leg* and the *foot*. I. The *os Femoris* is the only bone of the thigh. The two thigh bones are the largeſt and ſtrongeſt in the whole body. At its upper end the os femoris has a round head, that is received into the ſocket of the os innominatum. In moſt quadrupeds the head is oblong and makes a firmer articulation; but that ſhape not allowing of ſo much motion as a rounder head, could not be well adapted to the human ſubject. The two proceſſes near the head of this bone, are called the *greater* and *leſſer trochanters*. Theſe are as evidently formed for the inſertion of muſcles, as the neck of it which lies between them and the head, is formed to make room for thoſe numerous and powerful muſcles which are diſpoſed on the inſide of the thigh; beſides that by projecting outwards, longer levers are ſupplied for thoſe muſcles that are inſerted into its upper and external parts. Between the great trochanter and the neck of this bone, is a large ſinus, into which muſcles are inſerted; and between the two trochanters is a remarkable roughneſs, which begins the linea aſpera, and is deſigned for the ſame uſe. The middle of this bone, for the convenience of the muſcles, is bent forwards; and this would make it ſubject to break backwards, if there were not a ſtrong ridge on the back ſide, which ſtrengthens it conſiderably, and ſerves alſo for the advantageous inſertion of ſeveral muſcles: this ridge is called the *linea aſpera*. At the lower end of the thigh bone are two large heads, called the outer and inner apophyſes. Theſe are ſo contrived, partly from being projected backwards, and partly from their ſhape, as to remove the centre of motion very far behind the axis of the bone, ſo as to give great power to the muſcles that extend this joint, to raiſe the whole weight of the body, though it leſſens the power of the flexors that move the leg only. It is between theſe proceſſes, that the large blood-veſſels deſcend ſecurely to the leg.

(156.) II. The ROTULA, PATELLO, or *knee pan*, is ſeated on the fore part of the knee. It has the appearance of being buried as it were, in the centre of the tendon, through which however it ſoon extends, until the tendinous fibres are loſt, and appear to be converted into bone. When this bone is broken, the original tendinous diſpoſition ſeems to prevail in the part, ſince its broken extremities, unlike thoſe of all other fractured bones, unite with a tendon-like ſubſtance, which is rarely converted into bone, and eſpecially in thoſe caſes where the joint moſt perfectly recovers its motions. The uſe of the rotula is to ſecure the extenſors of the tibia, leſt, paſſing over the joint, they might be too much expoſed to external injuries. It alſo poſſeſſes the advantage mentioned above, of removing the common axis of the extenſors of the tibia farther from the centre of the motion, and thus becomes a moſt convenient medium for thoſe muſcles to unite in, to perform one common action.

(157.) III. The LEG is compoſed of two bones; the largeſt called *tibia* and the ſmalleſt *fibula*. The TIBIA, ſo called from its reſemblance to an old muſical pipe or flute, is the long thick triangular bone ſituated at the internal part of the leg, and continued in almoſt a ſtraight line from the thigh bone. At its upper end, are two ſhallow ſockets

ſockets, which receive the thigh bone, and between theſe, a rough proceſs, to which the crucial ligaments of the knee joint are connected. Near the upper end is a proceſs, into which the ligament or tendon of the patella is inſerted, and at the lower is the proceſs, which forms the inner ancle, and ſecures this bone from diſlocating outwards. Towards its upper end, the tibia is triangular, and even concave on the ſide next the muſcles; but lower, as the muſcles grow leſs and become tendinous, the bone grows rounder; that being upon the whole a ſtronger form. Yet it is by no means ſo ſtrong a bone as that of the thigh, though it bears a greater weight. It is perhaps ſomewhat the more able to do this by being ſtraighter and ſhorter, and bearing the weight of the body in a more perpendicular direction.

(158.) The FIBULA is the ſmall long bone, placed on the outſide of the leg, oppoſite to the external angle of the tibia; the ſhape of it is irregularly triangular. The head of the fibula has a ſuperficial circular cavity formed on its inſide, which, in a recent ſubject, is covered with a cartilage; and it is ſo cloſely connected to the tibia by ligaments, as to allow only a ſmall motion backwards and forwards. This head is protuberant and rough on its outſide, where a ſtrong round ligament and the muſculus biceps are inſerted; and, below the back part of its internal ſide, a tubercle may be remarked, that gives riſe to the ſtrong tendinous part of the ſolæus muſcle. Its upper end is joined to that bone below the joint of the knee, and its lower end ſinks into a ſhallow ſinus of the ſame bone, forming lower down the external ancle. This proceſs, with that of the tibia, ſtrengthens the ancle joint. It is a doubtful point, whether this bone contributes to the ſupport of the body; but, as affording a convenient ſurface for the attachment of muſcles, it is a part of conſiderable importance.

(159.) IV. The FOOT conſiſts of the *tarſus metatarſus* and *toes*; and contains in all 26 bones. 1. The TARSUS is compoſed of 7 bones, viz. the *aſtragalus*, *os calcis*, *naviculare*, *os cuboides*, and 3 *oſſa cuneiformia*. The ASTRAGALUS is the uppermoſt bone of the foot. It is large and is articulated with both the tibia and the fibula. It ſupports the tibia and is ſupported by the os calcis, which being projected backwards, makes a long lever for the muſcles to act with, that extend the ancle and raiſe the body upon the toes. Theſe two bones have a conſiderable motion between themſelves, and the aſtragalus alſo with the os naviculare. All the reſt have an obſcure motion one with another, and with the bones of the *metatarſus*: the principal ſhare of theſe motions falling towards the great toe, where lies the greateſt ſtreſs of action. Theſe bones, by yielding in this manner, are leſs liable to be broken; and acting as a kind of ſpring under the leg, render the motions of the body in walking more eaſy and graceful, and the bones to which they give ſupport, leſs ſubject to be fractured in any violent exertion.

(160.) The os CALCIS, is of a very irregular figure, and is the largeſt bone of the foot. Behind, it is formed into a conſiderable tuberoſity called *the heel*; without this tuberoſity, which ſupports us in an erect poſture, and when we walk, we ſhould be apt to fall backwards. On the internal ſurface of this bone, there is a conſiderable ſinuoſity, which affords a paſſage to the tendon of a muſcle: and to the poſterior part of it, a ſtrong tendinous cord, called *tendo achillis*, is attached, which is formed by the tendons of ſeveral muſcles united together. The articulations of all theſe bones are ſecured by ligaments.

(161.) The os NAVICULARE, is ſo called on account of its reſemblance to a little bark. At its poſterior part, which is concave, it receives the aſtragalus; anteriorly it is articulated with the cuneiform bones, and laterally it is connected with the os CUBOIDES, which forms an irregular cube, and is articulated with the os calcis; ſupports the two laſt bones of the metatarſus, and joins the third cuneiform bone and the os naviculare.

(162.) Each of the OSSA CUNEIFORMIA, reſembles a wedge, and from this ſimilitude their name is derived. They are placed next to the metatarſus, are united to the os naviculare, and ſupport the three firſt metatarſal bones. When theſe 7 bones of the tarſus are viewed together in the ſkeleton, they appear convex above, where they help to form the upper part of the foot; and concave underneath, where they form the hollow of the foot, in which the veſſels, tendons, and nerves of it are placed ſecure from preſſure.

(163.) II. The METATARSUS is made up of 5 bones. The firſt of theſe ſupports the great toe, and is much larger than the reſt, which nearly reſemble each other in ſize. Theſe bones are articulated by one extremity with the cuneiform bones and the os cuboides, and by the other end with the toes.

(164.) III. The TOES, like the fingers, conſiſt of three bones each except the great toe, which is formed of 2. Thoſe of the other 4 are diſtinguiſhed into 3 phalanges. In walking, the toes bring the centre of gravity perpendicular to the advanced foot; and as the ſoles of the foot are naturally concave, we can at pleaſure increaſe this concavity, and form a kind of vault, which adjuſts itſelf to the different inequalities that occur to us in walking; and which, without this mode of arrangement, would incommode us exceedingly.

(165.) There are ſeveral ſmall bones beſides theſe above deſcribed that are met with only in the adult ſkeleton, and in perſons who are advanced in life; which, from their reſemblance to the ſeeds of the ſeſamum, are called OSSA SESAMOIDEA.—They are commonly ſeen at the firſt joints of the great toe, and ſometimes at the joints of the thumb; they are likewiſe found at the lower extremity of the fibula, upon the condyles of the thigh bone, under the os cuboides of the tarſus, and in other parts of the body. Their ſize and number ſeem conſtantly to be increaſed by age and hard labour; and as they are generally found in ſituations where tendons and ligaments are moſt expoſed to the action of muſcles, they are now generally conſidered as oſſified portions of ligaments or tendons. The upper ſurface of theſe bones is uſually convex, and adherent to the tendon that covers it; the ſide which is next the joint is ſmooth and flat. Though their formation is accidental

cidental, yet they ſeem to be of ſome uſe, by raiſing the tendons farther from the centre of motion, and conſequently increaſing the power of the muſcles. In the great toe and thumb they are likewiſe uſeful, by forming a groove for the flexor tendons.

SECT. VII. *Of the* CARTILAGES, LIGAMENTS, *&c.*

(166.) CARTILAGES and LIGAMENTS are ſo neceſſarily connected with the bones, (all bones indeed in their firſt ſtage being only cartilages,) that they are always deſcribed under oſteology. If the moveable bones were not connected and kept firm by ſome ſtrong ſubſtance, they would be luxated at every motion of the joints; and if their hard rough unequal ſurfaces were to play on each other, their motion would not only be difficult, but the loſs of ſubſtance from attrition would be great. Therefore ligaments are made to obviate the firſt, and cartilages to prevent the other inconveniency. But becauſe ligaments and cartilages turn rigid, inflexible, and rough, unleſs they are kept moiſt, a ſufficient quantity of a proper liquor termed *ſynovia*, is ſupplied for their lubrication. Thoſe parts of a bone, therefore, which is articulated to another bone for motion, are covered or lined with a *cartilage*, as far as it moves upon, or is itſelf moved upon by another bone in any action; for cartilage being ſmoother and ſofter than bone, renders motion more eaſy than it would otherwiſe be, and prevents the bones from injuring each other by the friction of the joint.

(167.) In each articulation of the lower jaw, there is a looſe cartilage, upon which the condyloid proceſs moves on one ſide, while the jaw is thruſt forward. This ſtructure renders the motions of the jaw more firm, as that with interweaving cartilages makes it more looſe and voluble. There are alſo cartilages of this kind between the clavicles and the ſternum.

(168.) In the joint of the knee are two looſe, almoſt annular cartilages, which being thick at their outer edges, and thin at their inner ones, make the greateſt parts of the two ſockets in this joint. The uſe of theſe cartilages is to make variable ſockets to ſuit the different parts of the lower end of the os femoris; for none but a round head and a round cavity can ſuit in motion, unleſs the ſhape of one or the other alters; and it is plainly neceſſary, that this lower end of the os femoris ſhould be flattiſh, and projected backward, to give advantage to the muſcles that extend the tibia, by ſetting the centre of motion backward: which mechaniſm, though it equally leſſens the powers of thoſe muſcles which bend this joint, is yet of great ſervice, becauſe the external muſcles move this joint under the weight of the whole body, but the flexors only raiſe the legs; and as no head or ſocket moves ſo eaſily as round ones, there ſeems to be ſome proviſion made againſt the inconvenience of a flattiſh head and cavity, by having the friction made upon a ſurfaces; the os femoris moving upon the looſe cartilages, and the looſe cartilages, upon the tibia. This contrivance is practiſed by mechanics, where the friction of the joints of any of their machines is great, as between the parts of hook-hinges of heavy gates, and between the male and female ſcrews of large vices, where they uſually place a looſe ring.

(169.) There are other cartilages which ſerve to give ſhape to parts. Of this ſort are the ciliary cartilages at the edge of the eye-lids, the cartilages of the outer ears, and thoſe which compoſe the noſtrils, which have this particular advantage in theſe places, that they ſupport and ſhape the parts as well as bones do, and without being liable to be broke.

(170.) Bones that are articulated for motion are tied together by very ſtrong ligaments, to prevent their diſlocating, and theſe ligaments alſo ſurround the joints, and preſerve their lubricating mucus. The thickneſs and ſtrength of theſe ligaments are proportioned to the actions of the ſeveral joints, and their lengths are no more than ſufficient to allow a proper degree of motion; but the forms of them are different, according as the actions of the ſeveral joints are to be performed.

(171.) To the bones of thoſe limbs that move in every direction, are attached *ligaments* like purſes, which ariſe from or near the edges of the ſockets of the receiving bones, and are inſerted all round the received bones a little below their heads. The beginnings of theſe ligaments, from the edges of the ſockets of the ſcapula and os innominatum, are of a nature almoſt cartilaginous, which ſerves in the ſcapula to make a larger ſocket, and ſuch a one as will alter its figure as the bone moves, for the reaſon given with regard to the looſe cartilage of the knee. Indeed the head of the os humeri not being an exact portion of a ſphere, requires ſuch a ſocket, and the hard part of this ligament, in the acetabulum of the os innominatum, makes that cavity deeper than the ſemidiameter of the ſocket, by which means the articulation is made ſtronger without any hindrance to motion. It will give way to the neck of the os femoris when it preſſes againſt it; and the thigh bone being more diſpoſed to be diſlocated upwards than any other way, the upper ſide of this burſal ligament is made exceedingly ſtrong to prevent ſuch an accident. From the lower edge of the acetabulum or ſocket of the os innominatum ariſes a ligament about an inch long, called *teres* or *rotundum*, which length is neceſſary for that quantity of motion which this joint has in human bodies. It alſo hinders the os femoris from diſlocating upwards, though downwards it will ſuffer it to go far out of the ſocket. This ligament is alſo thought to aſſiſt in preſſing the gland in the bottom of the acetabulum, ſo as to compel it to yield its ſecretions.

(172.) The ligaments in thoſe joints which admit only of flexion and extenſion, differ from the foregoing in this, that they are much ſhorter and ſtronger at the ſides of the joints, and thinner backward and forward. Beſides theſe ligaments, in the middle and back-part of the joint of the knee, are two very ſtrong ligaments, which ariſe from a proceſs at the end of the tibia. They croſs each other in ſuch a manner, as is beſt calculated to ſecure the joint from being diſplaced in any direction. They alſo hinder the extenſors of the tibia from pulling that bone too far forwards, and are ſo connected to the ſemilunar cartilages,

as

as to move them as the joint moves. But beſides theſe, there exiſts in this joint, another ſmall ligament, which ariſes from the os femoris, and ends in the fatty membrane that it ſupports. From this arrangement of parts, it ſeems evident, that the knee cannot be completely diſlocated, without breaking the croſs ligaments.

(173.) The bones of the carpus and tarſus are connected together by the ligaments running promiſcuouſly upon their ſurfaces from one to another. At the under ſide of the tarſus, theſe are exceedingly ſtrong, becauſe they ſupport the whole body. There is alſo joined to the carpus a ſtrong ligament, which runs from the fifth bone to the eighth, and the proceſs of the fourth bone. The proper uſe of this is, to bind down the tendons of thoſe muſcles that bring the fingers into a ſtate of flexion.

(174.) The proceſſus dentatus of the ſecond vertebra is tied to the ſkull by a ligament, and kept cloſe to the fore part of the firſt vertebra by another in that vertebra, that it may not bruiſe the ſpinal marrow; and when either this ligament or proceſs is broke, it occaſions that ſort of broken neck, which is attended with ſudden death. All the bones of the vertebræ, and every joint that is without motion, and not joined by a ſuture, as the oſſa innominata with each other, and the os ſacrum with the oſſa innominata, are joined by intervening ligaments, or, as they are commonly called, cartilages.

(175.) The oſſa innominata are alſo tied by very ſtrong ligaments, which run from the back of the ſpines of the oſſa ilia, to the os ſacrum, and other ligaments which go from the os ſacrum and os coccygis to the acute and obtuſe proceſſes of the oſſa iſchia: theſe ligaments ſerve alſo for origins of muſcles. Towards the great foramen of the oſſa innominata, the acetabulum has a drop notch, acroſs which runs a ligament that completes the ſocket. A ligament ſomewhat like this exiſts alſo between the proceſſes of the ſcapula.—From the edge of the ilium to that of the os pubis, runs a ligament which is contiguous to, and appears to be a part of, the tendons of the muſcles of the abdomen. The uſe of this is to cover the iliac veſſels as they deſcend to the thigh.

(176.) The ligaments alſo ſupply the place of bones, in ſeveral caſes. Thus the parts in the pelvis are more ſafely ſupported below by ligaments than they could have been by bones. The ligaments placed in the great holes of the oſſa innominata and between the bones of the fore-arm and leg, afford convenient origin to muſcles.—Immoveable bones are firmly connected by them; of which the conjunction of the os ſacrum and innominatum is an example. They afford a ſocket for moveable bones to play in, as we ſee part of the aſtragalus does on the ligament ſtretched from the heel bone to the ſcaphoid.

(177.) In every joint, where the bones are faced with a cartilage, to favour a ſliding kind of motion, there are ſmall glands, which ſeparate a mucilaginous fluid, called *ſynovia*. Theſe are commonly ſituated in the joint, after ſuch a manner as to be gently preſſed, but not deſtroyed by its motion. By this means, when there is the greateſt neceſſity for this liquor, that is, when the moſt frequent motions are performed, the greateſt quantity of it muſt be ſeparated. Theſe glands are ſoft and pappy, but not friable; in ſome of the large joints they are of the conglomerate kind, or a great number of ſmall glandules are wrapt up in one common membrane.—Their excretory ducts are long, and hang looſe, like ſo many fringes, within the articulation; which, by its motion and preſſure, prevents obſtructions in the body of the gland or its excretories; and promotes the return of this liquor, when fit to be taken up by the abſorbent veſſels, which muſt be in the joints, as well as in the other cavities in the body; and, at the ſame time, the preſſure on the excretory ducts hinders a ſuperfluous unneceſſary ſecretion, while the fimbriated diſpoſition of theſe excretories does not allow any of the ſecreted liquor to be puſhed back again by theſe canals towards the glands. Very often their fountains of ſlimy liquor appear only as a network of veſſels. Frequently they are almoſt concealed by cellular membranes containing the fat, and ſometimes ſmall ſimple mucous folliculi may be ſeen. The different joints have theſe organs in different numbers and ſizes. The conglomerate ones do not vary much, eſpecially as to ſituation, in the ſimilar joints of different bodies; but the others are more uncertain.

EXPLANATION OF PLATE VI. FIG. 1.

(178.) BONES OF THE SKELETON.—1. Os frontis. 2. Os bregmatis. 3. Os temporis. 4. Os occipitis. 5. Os malæ. 6. Os maxillæ ſuperioris. 7. Os naſi. 8. Dentes. 9. Os maxillæ inferioris. 10. Tranſverſe proceſſes of the vertebræ of the neck. 11. Clavicula. 12. Proceſſus acromion of the ſcapula. 13. Scapula. 14. Os humeri. 15. Radius. 16. Ulna. 17. Carpus. 18. Metacarpus. 19. Bones of the fingers. 20. Sternum. 21. Cartilago enſiformis. 22. Ribs. 23. Vertebræ of the loins with their tranſverſe proceſſes. 24. Os ilium. 25. Os ſacrum. 26. Os coccygis. 27. Os femoris. 28. Rotula. 29. Fibula. 30. Tibia. 31. Os calcis. 32. Tarſus. 33. Metatarſus. 34. Bones of the toes.

(179.) EXPLANATIONS OF THE ANATOMICAL FIGURE, *pl.* vi. *fig.* 2. which exhibits a VIEW OF THE EXTERNAL MUSCLES.—1. Muſculus triceps extenſor cubiti. 2. Deltoides. 3. Teres major. 4. Latiſſimus dorſi. 5. Pectoralis. 6. Obliquus deſcendens abdominis. 7. Rectus abdominis. 8. Sartorius. 9. Rectus femoris. 10. Vaſtus externus. 11. Vaſtus internus. 12. Gaſtrocnemius. 13. Solæus. 14. Tibialis anticus.

PART II. MYOLOGY.

SECT. I. *Of the* MUSCLES *in* GENERAL.

(180.) THE MUSCLES are the organs of motion. The parts uſually included under this name conſiſt of diſtinct portions of fleſh, ſuſceptible of contraction and relaxation; the motions of which, in a natural and healthy ſtate, are ſubject to the will, and for this reaſon, they are called VOLUNTARY muſcles. But beſides theſe, there are other parts of the body that owe their power of contraction to their muſcular fibres; thus the heart

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

heart is of a muſcular texture, forming what is called a hollow muſcle; and the urinary bladder, ſtomach, inteſtines, &c. are enabled to act upon their contents, merely becauſe they are provided with muſcular fibres. Theſe are called INVOLUNTARY muſcles, becauſe their motions are not dependent on the will. The muſcles of reſpiration, being in ſome meaſure influenced by the will, are ſaid to have a MIXED motion.

(181.) MUSCULAR FIBRES are bundles of reddiſh coloured threads, which perform all the motions viſible in the human body. When many of theſe fibres are collected together, and appear more evidently red, they are called a MUSCLE.—In every muſcle we meet with long ſoft threads of *fibres*, ſomewhat elaſtic, or extenſible, and almoſt conſtantly diſpoſed parallel with each other; and theſe, being ſurrounded with a good deal of cellular ſubſtance, are by that faſtened together into little bundles, called *lacertuli*; which are again tied together into larger bundles, by a more looſe cellular net-work, that contains ſome fat; and between theſe we conſtantly perceive membranous partitions and ſtripes of the cellular ſubſtance removing them farther from each other, till at laſt a number of them combined together, either paralel or inclined, are ſurrounded with a more thin and denſe cellular membrane continuous with that of their partitions; and this being again ſurrounded by a thicker plate of the cellular ſubſtance, parts the whole bundle from the adjacent fleſh, and gives it the denomination of a *ſingle* or *entire muſcle*.

(182.) In every one of theſe threads there appears a leſſer ſeries of filaments, which, by oblique extremities, are cemented to others of the ſame kind, forming together a large fibre. The generality of the muſcles, but more eſpecially thoſe which are inſerted into the bones, have other fibres fixed to them; but theſe are condenſed into a more ſlender, hard, and ſhining ſubſtance, of a ſilver colour, which has the name of TENDON. When the tendinous fibres expand into a broad flat ſurface, they form what is called an *oponeuroſis*.

(183.) Some anatomiſts have deſcribed the muſcular fibres to be ſtrings of bladders, and have endeavoured to account for muſcular motion by an expanſion made from an influx of blood and animal ſpirits into theſe bladders; but as the muſcles do not increaſe their bulk ſenſibly in contracting, this hypotheſis cannot be correct. Other anatomiſts thought that in this way the muſcles might be contracted by a ſwelling, ſcarce ſenſible, if the bladders were but very ſmall; for, ſay they, ſuppoſing a bladder of any determined bigneſs can raiſe a weight a foot, a hundred bladders, whoſe diameters are each a hundredth part of the former, will raiſe the weight to the ſame height. But the force of inflation, and the ſwelling of all together, will be ten thouſand times leſs, and it will alſo raiſe ten thouſand times leſs weight, which they have not obſerved. Therefore not one ſuch ſtring of bladders, but ten thouſand, muſt be applied to do the ſame thing that the one bladder will do; and they will have the ſame ſwelling; otherwiſe, it would be eaſy to ſhew how to make a perpetuum mobile of almoſt any force.

(184.) Muſcles are of two ſorts, *rectilinear* and *penniform*. The RECTILINEAR MUSCLES have their fibres almoſt parallel, in the ſame or near the ſame direction with the axis of the muſcle.—The latter have their fibres joined, in an oblique direction, to a tendon paſſing in or near the axis, or elſe on their outſide. Rectilineal muſcles, if their origins and inſertions lie in little compaſs, are never of any conſiderable thickneſs, unleſs they are very long, becauſe the outer fibres would compreſs the inner ones, and render them almoſt uſeleſs. Every rectilineal muſcle, therefore, whoſe inner fibres are compreſſed by the outer, has its inner fibres longer than its external fibres, in order that they may be capable of an equal quantity of contraction.

(185.) The PENNIFORM MUSCLES, though in a manner free from the inconvenience of one fibre compreſſing another, and though by the obliquity of their fibres nothing is abated of their moment, yet the fibres of the penniform muſcles becoming more and more oblique as they contract their ſtrength decreaſes, and their velocity increaſes, which makes them leſs uniform in their actions than the rectilineal muſcles: For in all caſes, juſt ſo much more weight as rectilineal fibres will raiſe them oblique ones, the oblique will move their weight with ſo much greater velocity than the rectilineal: which is making their moments equal: So that in the ſtructure of an animal, like all mechanic engines, whatever is gained in ſtrength is loſt in velocity, and whatever is gained in velocity is loſt in ſtrength. A penniform muſcle, therefore, is never exerted where a rectilineal muſcle can be uſed; and the caſes in which a rectilineal muſcle cannot be uſed, are where the ſhape of a muſcle is ſuch as that the inward fibres would be too much compreſſed, or where the rectilineal fibres could not have a lever to act with, ſuitable to their quantity of contraction, which is the caſe with all the long muſcles of the fingers and toes.

(186.) Every muſcle muſt be inſerted in, or paſs over the centre of the motion of the joint it moves, at a diſtance ſuitable to its quantity of contraction, and the quantity of motion in the joint moved; for if it were to be inſerted too near, the motion of the joint would be performed before the muſcle became completely contracted; if too far off, the muſcle would ceaſe to contract before the whole motion of the joint was performed. And though the quickneſs and quantity of motion in a muſcle will be, *cæteris paribus*, as the length of its fibres; (for if a fibre 4 inches long will contract one inch in a given time, a fibre 8 inches long will contract two inches in the ſame time; and the ſtrength of a muſcle or power to raiſe a weight, *cæteris paribus*, will be as the number of its fibres; for if one fibre will raiſe a grain weight, 20 fibres will raiſe 20 grains:) Yet two muſcles of equal magnitude, the one long, and the other ſhort, will both move the ſame weight with the ſame velocity when applied to a bone; becauſe the levers they act with muſt be as their lengths, and therefore the penniform and ſhort thick muſcles are never applied to a bone for the ſake of ſtrength, nor long fibred muſcles for quickneſs; for whatever is gained by the form

of the muſcle, whether ſtrength or quickneſs, muſt be loſt by their inſertion into the bone. Either the muſcles muſt not perform all that they can, or the bones muſt have leſs motion than they are capable of.

(187.) In the limbs ſeveral muſcles paſs over two joints, both of which are liable to move at once, with a force proportionable to the levers they act with, upon each joint; but either joint being fixed with an antagoniſt muſcle, the whole force of ſuch muſcles will be exerted upon the other joint; which in that caſe may be moved with a velocity equal to what is in both joints, when theſe muſcles act upon both at once. This mechaniſm is of the utmoſt importance.

(188.) The proper uſe and action of any muſcle is that which it has without the neceſſary aſſiſtance of any other muſcle, and what that is, in a muſcle moving a joint, we may always know in any ſituation, and with what force it acts, cæteris paribus, by dropping a line from the centre of motion of the joint it moves, perpendicular into the axis of the muſcle. But in a joint which admits only of flexion and extenſion, this line muſt alſo be perpendicular to the axis of motion in that joint, and the action of the muſcles will be in the direction of that particular line, and the force with which it acts in any ſituation will be, cæteris paribus, as the length of that perpendicular line.

(189.) Every muſcle, ſo far as it is diſtinct, and is moved againſt any part, is covered with a ſmooth cellular membrane to make the friction eaſy; but where the muſcles are externally tendinous, their ſurfaces are generally ſmooth enough to make ſuch a covering unneceſſary. Beſides this membrane there is another, known by the name of *faſcia tendinoſa*, which deſerves to be particularly conſidered. The ſtrong one on the outſide of the thigh, which belongs to the faſcialis and gluteus muſcles, is of great uſe, in raiſing the gluteus farther from the centre of motion of the joint it moves to increaſe its force. In like manner the faſcia detached from the tendon of the biceps cubiti alters its direction for the ſame purpoſe; but thoſe on the outſide of the tibia and cubit, &c. are only flat tendons from which the fibres of the muſcles ariſe as from the bones. There exiſt alſo in many places tendons between the muſcles, from which each muſcle ariſes in like manner; for the bones themſelves are not ſufficient to give origin to half the fibres of the muſcles that belong to them.

(190) We cannot cloſe this ſection without taking notice of the IRRITABILITY of the muſcles. If a muſcle is pricked or irritated, it immediately contracts. This is called its irritable principle, and this irritability is to be conſidered as the characteriſtic of muſcular fibres, and may ſerve to prove their exiſtence in parts that are too minute to be examined by the eye. This power, which diſpoſes the muſcles to contract when ſtimulated, independent of the will, is ſuppoſed to be inherent in them; and is therefore named by Halier *vis inſita*. This property is not to be confounded with elaſticity which the membranes and other parts of the body poſſeſſes in a greater or leſs degree in common with the muſcles; nor with ſenſibility, for the heart, though the moſt irritable, ſeems to be the leaſt ſenſible of any of the muſcular parts of the body. After a muſcular fibre has contracted, it ſoon returns to a ſtate of relaxation, till it is excited afreſh, and then it contracts and relaxes again. We may likewiſe produce ſuch a contraction, by irritating the nerve leading to a muſcle, although the nerve itſelf is not affected. This principle is found to be greater in ſmall than in large, and in young than in old, animals. In the voluntary muſcles theſe effects of contraction and relaxation of the fleſhy fibres are produced in obedience to the will, by what may be called the *vis a tergo*, a property that is not to be confounded with the *vis inſita*. The exiſtence of a *vis inſita*, however, different from a *vis nervea*, has been called in queſtion by ſeveral, particularly by Doctor Monro, who has ſtated very formidable objections againſt it, in his Obſervations on the Nervous Syſtem, of which we ſhall afterwards have occaſion to take particular notice, under NEUROLOGY.

SECT. II. *Of the* PARTICULAR MUSCLES.

(191.) To prevent tautology and circumlocution, we have thrown the enumeration and deſcription of the particular muſcles into the form of a table; in which the name, origin, inſertion, and principal uſe of each muſcle, will be ſeen at one glance, deſcribed in a few words. It is however to be underſtood, that this does not include *all* the muſcles of the body; ſince thoſe belonging to the eyes, internal ear, inteſtinum rectum, &c. are mentioned in other parts of the work. We muſt alſo remark, that though almoſt all the muſcles are in *pairs*, mention is here made only of the muſcles of one ſide.

TABLE OF THE MUSCLES.

(192.) MUSCLES SITUATED UNDER THE INTEGUMENTS OF THE CRANIUM.

Name.	*Origin.*	*Inſertion.*	*Uſe.*
1. Occipito-frontalis.	From the tranſverſe ridge of the os occipitis.	Into the ſkin of the eye-brows.	To pull the ſkin of the head backwards and to raiſe the eye brows and ſkin of the fore-head.
2. Corrugator ſupercilii.	From above the joining of the os frontis, os naſi, and os maxillare.	Into the inner part of the occipito-frontalis.	To draw the eye brows towards each other, and to wrinkle the forehead.

(195.

(193.) Muscles of the Eye-lids.

Name.	Origin.	Insertion.	Use.
1. Orbicularis palpebrarum.	From around the edge of the orbit.	Into the nasal process of the os maxillare.	To shut the eye.
2. Levator palpebræ superioris.	From the bottom of the orbit, near the optic foramen.	Into the cartilage of the upper lid.	To open the eye.

(194.) Muscles of the External Ear.

1. Attollens auriculam.	From the tendon of the occipito-frontalis near the os temporis.	Into the upper part of the ear.	To raise the ear.
2. Anterior auriculæ.	From near the back part of the zygoma.	Into an eminence behind the helix.	To raise this eminence, and to pull it forwards.
3. Retrahentes (a) auriculæ.	From the outer and back part of the root of the mastoid process.	Into the convex part of the concha.	To stretch the concha, and pull the ear backwards.

(195.) Muscles of the Cartilages of the Ear.

1. Tragicus.	From the outer and middle part of the concha near the tragus.	Into the upper part of the tragus.	To depress the concha, and pull the point of the tragus a little outwards.
2. Anti-tragicus.	From the root of the inner part of the helix.	Into the upper part of the anti-tragus.	To dilate the mouth of the concha.
3. Transversus auriculæ.	From the upper part of the concha.	Into the inner part of the helix.	To stretch the concha and scapha, and likewise to pull the parts it is connected with towards each other.
4. Helicis major.	From the upper, anterior, and acute part of the helix.	Into the cartilage of the helix, a little above the tragus.	To depress the upper part of the helix.
5. Helicis minor.	From the lower and fore part of the helix.	Into the helix, near the fissure in its cartilage.	To contract the fissure.

(196.) Muscle of the Nose.

Compressor (a) nasi.	From the upper part of the root of the ala nasi.	Into the nasal process of the os maxillare, and anterior extremity of the os nasi.	To straighten the nostrils, and likewise to corrugate the skin of the nose.

(197.) Muscles of the Mouth and Lips.

1. Levator labii superioris, alæque nasi.	From the outer part of the orbitar process of the os maxillare, and from the nasal process of that bone, where it joins the os frontis.	Into the upper lip and ala of the nose.	To draw the upper lip and skin of the nose upwards and outwards.
2. Levator anguli oris.	From the os maxillare superius, between the orbitar foramen and the first dens molaris.	Into the orbicularis oris at the angle of the mouth.	To raise the corner of the mouth.
3. Zygomaticus major.	From the os malæ, near the zygomatic suture.	Into the angle of the mouth.	To raise the angle of the mouth, and make the cheek prominent, as in laughing.
4. Zygomaticus minor.	Immediately above the origin of the zygomaticus major.	Into the angle of the mouth.	To raise the angle of the mouth obliquely outwards.
5. Buccinator.	From the alveoli of the dentes molares in the upper and lower jaws.	Into the angle of the mouth.	To contract the mouth and draw the angle of it outwards and backwards.
6. Depressor labii superioris, alæque nasi.	From the os maxillare superius, immediately above the gums of the dentes incisores.	Into the root of the ala nasi and upper lip.	To draw the ala nasi and upper lip downwards.

Name.	Origin.	Insertion.	Use.
7. Depreſſor anguli oris.	At the ſide of the chin from the lower edge of the maxilla inferior.	Into the angle of the mouth.	To draw the corne of the mouth downwards.
8. Depreſſor labii inferioris.	From the lower and anterior part of the maxilla inferior.	Into the upper lip.	To draw the unde lip downwards an ſomewhat outward
9. Levator labii inferioris.	From near the gums of the inciſores and caninus of the maxilla inferior.	Into the under lip and ſkin of the chin.	To raiſe the under l and ſkin of the chi
10. Orbicularis oris (C).			To ſhut the mouth by conſtringing th lips.

(198.) MUSCLES OF THE LOWER JAW.

1. Temporalis.	From part of the os bregmatis and os frontis; ſquamous part of the os temporis; back part of the os malæ, and the temporal proceſs of the os ſpenoides (D).	Into the coronoid proceſs of the lower jaw.	To move the lowe jaw upwards.
2. Maſſeter (E).	From the malar proceſs of the os maxillare, and the lower edges of the os malæ, and of the zygomatic proceſs of the os temporis.	Into the baſis of the coronoid proceſs, and that part of the jaw which ſupports that and the condyloid proceſs.	To raiſe and likewiſ to move the jaw little forwards an backwards.
3. Pterygoideus internus.	From the inner ſurface of the outer wing of the pterygoid proceſs of the os ſphenoides, and from the proceſs of the os palati, that helps to form the pterygoid foſſa.	Into the lower jaw on its inner ſide and near its angle.	To raiſe the lowe jaw, and draw it little to one ſide.
4. Pterygoideus externus.	From the external ala of the pterygoid proceſs, a ſmall part of the adjacent os maxillare, and a ridge in the temporal proceſs of the os ſphenoides.	Into the fore part of the condyloid proceſs of the lower jaw, and likewiſe of the capſular ligament.	To move the jaw for wards and to the op poſite ſide (F); an at the ſame time, t prevent the ligamen of the joint from be ing pinched.

(199.) MUSCLES SITUATED AT THE FORE PART OF THE NECK.

1. Latiſſimus colli (G).	From the cellular membrane covering the pectoral, deltoid, and trapezius muſcles.	Into the ſide of the chin and integuments of the cheek.	To draw the cheek and ſkin of the fac downwards; and, when the mouth i ſhut, to draw al that part of the ſkin to which it is con nected below the lower jaw upwards.
2. Maſtoideus (H).	From the upper part of the ſternum, and from the upper and fore part of the clavicle.	Into the maſtoid proceſs, and as far back as the lambdoidal ſuture.	To move the head to one ſide, or, when both muſcles act, to bend it forwards.

(200.) MUSCLES SITUATED BETWEEN THE TRUNK AND THE OS HYOIDES.

1. Omo-hyoideus (I).	From the upper coſta of the ſcapula near its niche; from part of a ligament that extends acroſs this niche, and ſometimes by a few fibres, from the coracoid proceſs.	Into the baſis of the os hyoides	To draw the os hyoides in an oblique direction downwards.
2. Sterno-hyoideus.	From the cartilage of the firſt rib, the inner and upper part of the ſternum, and a ſmall part of the clavicle.	Into the baſis of the os hyoides.	To draw the os hyoides downwards.
3. Hyo-thyroideus.	From part of the baſis and horn of the os hyoides.	Into a rough oblique line at the ſide of the thyroid cartilage.	To raiſe the thyroid cartilage, or depreſs the os hyoides.

Name.	*Origin.*	*Inſertion.*	*Uſe.*
4. Sterno-thyroideus.	From between the cartilages of the 1ſt and 2d ribs, at the upper and inner part of the ſternum.	Immediately under the hyo-throideus.	To pull the thyroid cartilage downwards.
5. Crico-thyroideus.	From the anterior part and ſide of the cricoid cartilage.	Into the lower part and inferior horn of the thyroid cartilage.	To pull the cricoid cartilage upwards and backwards, or the thyroid forwards and downwards.

(201.) MUSCLES SITUATED BETWEEN THE OS HYOIDES AND THE LOWER JAW.

1. Digaſtricus (K).	From a foſſa at the root of the maſtoid proceſs, and likewiſe from the os hyoides.	Into the lower and anterior part of the chin.	To draw the lower jaw downwards.
2. Stylo-hyoideus (L).	From the baſis of the ſtyloid proceſs.	Into the ſide and forepart of the os hyoides near its baſe.	To draw the os hyoides obliquely upwards.
3. Mylo-hyoideus (M.)	From the baſis of the lower jaw, between the laſt dens molaris and the chin.	Into the baſis of the os hyoides.	To move the os hyoides to either ſide, forwards or upwards.
4. (N.) Genio-hyoideus.	From the inſide of the chin.	Into the baſe of the os hyoides.	To move the os hyoides forwards or upwards.
5. Genio-gloſſus.	From the inſide of the chin.	Into the tongue and baſis of the os hyoides.	To move the tongue in various directions.
6. Hyo-gloſſus (O).	From the horn, baſis, and appendix of the os hyoides.	Into the tongue laterally.	To draw the tongue downwards and inwards.
7. Linguälis.	Laterally from the root of the tongue	Into the extremity of the tongue.	To ſhorten the tongue and draw it backwards.
8. Stylo-gloſſus.	From the ſtyloid proceſs, and ſometimes alſo from a ligament that extends from thence to the angle of the lower jaw.	Into the ſide of the tongue from the root to near its tip.	To move the tongue backwards and to one ſide.
9. Stylo-pharyngæus.	From the baſis of the ſtyloid proceſs.	Into the ſide of the pharynx and poſterior part of the thyroid cartilage.	To raiſe the thyroid cartilage and pharynx, and likewiſe to dilate the latter.
10. Circumflexus-palati.	From near the bony part of the Euſtachian tubes and from the ſpinous proceſs of the os ſphenoides.	Into the ſemilunar edge of the os palati, and the velum pendulum palati (P).	To dilate and draw the velum obliquely downwards.
11. Levator palati.	From the membranous part of the Euſtachian tube, and the extremity of the os petroſum.	Into the velum pendulum palati.	To pull the velum backwards.

(202.) MUSCLES SITUATED ABOUT THE FAUCES.

1. Palato-pharyngæus.	From the lower and anterior part of the cartilaginous extremity of the Euſtachian tube (Q); the tendinous expanſion of the circumflexus palati; and the velum pendulum palati near the baſis and back part of the uvula.	Into the upper and poſterior part of the thyroid cartilage.	To raiſe the pharynx and thyroid cartilage, or to pull the velum and uvula backwards and downwards.
2. Conſtrictor iſthmi faucium.	From near the baſis of the tongue laterally.	Into the velum pendulum palati, near the baſis and fore part of the uvula.	To raiſe the tongue and draw the velum towards it (R).
3. Azygos uvulæ.	From the end of the ſuture that unites the oſſa palati.	Into the extremity of the uvula.	To ſhorten the uvula, and bring it forwards and upwards.

(203.)

(203.) MUSCLES SITUATED AT THE BACK PART OF THE PHARYNX.

Name.	*Origin.*	*Inſertion.*	*Uſe.*
1. Conſtrictor pharyngis ſuperior.	From the cuneiform proceſs of the occipital bone; the pterygoid proceſs of the os ſphenoides, and from each jaw near the laſt dens molaris (s).	Into the middle of the pharynx.	To move the pharynx upwards and forwards, and to compreſs its upper part.
2. Conſtrictor pharyngis medius (t).	From the horn and appendix of the os hyoides, and from the ligament that unites it with the thyroid cartilage.	Into the middle of the proceſſus cuneiformis of the occipital, bone, about its middle and before the great foramen.	To draw the os hyoides and pharynx upwards, and to compreſs the latter.
3. Conſtrictor pharyngis inferior (v).	From the cricoid and thyroid cartilage.	Into the middle of the pharynx.	To compreſs part of the pharynx.

(204.) MUSCLES ABOUT THE GLOTTIS.

1. Crico-arytænoideus lateralis.	From the ſide of the cricoid cartilage.	Into the baſis of the arytænoid cartilage laterally.	To open the glottis.
2. Crico-arytænoideus poſticus.	From the cricoid cartilage poſteriorly.	Into the baſis of the arytænoid cartilage poſteriorly.	To open the glottis.
3. Arytænoideus obliquus.	From the baſis of one of the arytænoid cartilages.	Near the extremity of the other arytænoid cartilage.	To draw the parts it is connected with towards each other.
4. Arytænoideus tranſverſus.	From one of the arytænoid cartilages laterally.	Into the other arytænoid cartilage laterally.	To ſhut the glottis.
5. Thyreo-arytænoideus.	From the poſterior and under part of the thyroid cartilage.	Into the arytænoid cartilage.	To draw the arytænoid cartilage forwards.
6. Arytæno-epiglottideus.	From the upper part of the arytænoid cartilage laterally.	Into the ſide of the epiglottis.	To move the epiglottis outwards.
7. Thyreo-epiglottideus.	From the thyroid cartilage.	Into the ſide of the epiglottis.	To pull the epiglottis obliquely downwards (w).

(205.) MUSCLES AT THE FORE PART OF THE NECK, CLOSE TO THE VERTEBRÆ.

1. Rectus capitis internus major.	From the anterior extremities of the tranſverſe proceſſes of the five lowermoſt cervical vertebræ.	Into the fore part of the cuneiform proceſs of the os occipitis.	To bend the head forwards.
2. Rectus capitis internus minor.	From the anterior and upper part of the firſt cervical vertebræ.	Near the baſis of the condyloid proceſs of the occipitis.	To aſſiſt the laſt deſcribed muſcle.
3. Rectus capitis lateralis.	From the anterior and upper part of the tranſverſe proceſs of the firſt cervical vertebra.	Into the os occipitis, oppoſite to the ſtylo-maſtoid foramen.	To move the head to one ſide.
4. Longus colli.	Within the thorax, laterally from the bodies of the three uppermoſt dorſal vertebræ; from the baſis and fore part of the tranſverſe proceſſes of the firſt and ſecond dorſal vertebræ, and of the laſt cervical vertebra; and laſtly from the anterior extremities of the tranſverſe proceſſes of the 6th, 5th, 4th, and 3d cervical vertebræ.	Into the ſecond cervical vertebra anteriorly.	To pull the neck to one ſide (x).

(206.) Muscles at the Fore Part of the Abdomen.

Name.	Origin.	Insertion.	Use.
1. Obliquus externus.	From the lower edges of the eight inferior ribs, near their cartilages.	Into the linea alba (y), ossa pubis (z), and spine of the ilium (a).	To compress and support the viscera, assist in evacuating the fæces and urine, drawn down the ribs, and bend the trunk forwards, or obliquely to one side.
2. Obliquus internus.	From the spinous process of the three lowermost lumbar vertebræ, the back part of the os sacrum, the spine of the ilium, and back part of Fallopius's ligament (c).	Into the cartilages of all the false ribs, linea alba (b), and fore part of the pubis.	To assist the obliquus externus.
3. Transversalis.	From the cartilages of the seven inferior ribs; the transverse processes of the last dorsal, and four upper lumbar vertebræ; the inner part of Fallopius's ligament, and the spine of the ilium.	Into the linea alba and cartilago ensiformis.	To compress the abdominal viscera.
4. Rectus abdominis.	From the upper edge of the pubis and the symphysis pubis.	Into the cartilages of the 5th, 6th, and 7th ribs, and the edge of the cartilago ensiformis (d.)	To compress the fore part of the abdomen, and to bend the trunk forwards.
5. Pyramidalis. (e).	From the anterior and upper part of the pubis.	Into the linea alba and inner edge of the rectus, commonly about two inches above the pubis.	To assist the lower portion of the rectus.

(207.) Muscles at the Fore Part of the Thorax.

1. Pectoralis major.	From the cartilaginous ends of the 5th and 6th ribs; the sternum, and anterior part of the clavicle.	Into the upper and inner part of the os humeri (f).	To draw the arm forwards, or obliquely forwards.
2. Subclavius.	From the cartilage of the first rib.	Into the under surface of the clavicle.	To move the clavicle forwards and downwards, and to assist in raising the first rib.
3. Pectoralis minor (g).	From the upper edges of the 3d, 4th, and 5th ribs.	Into the coracoid process of the scapula.	To move the scapula forwards and downwards, or to elevate the ribs.
4. Serratus magnus.	From the eight superior ribs.	Into the basis of the scapula.	To bring the scaplua forwards.

(208.) Muscles that concur in forming the Thorax.

1. Diaphragma (h).			
2. Levatores costarum.	From the transverse processes of the last cervical, and the eleven upper dorsal vertebræ.	Into the upper side of each rib near its tuberosity.	To move the ribs upwards and outwards.
3. Intercostales externi.	From the lower edge of each upper rib.	Into the superior edge of each lower rib.	To elevate the ribs.
4. Intercostales interni (i).			
5. Sterno-costales (k).	From the cartilago ensiformis, and the lower and middle part of the sternum.	Into the cartilages of the 2d, 3d, 4th, 5th, and 6th ribs.	To depress the cartilages of the ribs.

(209.) Muscles at the Back Part of the Neck and Trunk.

1. Trapezius (l), or cucullaris.	From the middle of the os occipitis, and the spinous processes of the two inferior cervical, and of all the dorsal vertebræ (m).	Into the posterior half of the clavicle part of the acromion, & the spine of the scapula.	To move the scapula.

2. Rhomboideus

Name.	*Origin.*	*Inſertion.*	*Uſe.*
2. Rhomboideus (n).	From the ſpinous proceſſes of the three lowermoſt cervical, and of all the dorſal vertebræ.	Into the baſis of the ſcapula.	To move the ſcapula upwards and backwards.
3. Latiſſimus dorſi.	From part of the ſpine of the os ilium, the ſpinous proceſſes of the os ſacrum and lumbar vertebræ, and of ſix or eight of the dorſal vertebræ; alſo from the four inferior falſe ribs near their cartilages.	Into the os humeri, at the inner edge of the groove for lodging the long head of the biceps muſcle.	To draw the os humeri downwards & backwards, and to roll it upon its axis.
4. Serratus inferior poſticus.	From the ſpinous proceſſes of the two lowermoſt dorſal, and of three of the lumbar vertebræ.	Into the lower edges of the three or four lowermoſt ribs near their cartilages.	To draw the ribs outwards, downwards, and backwards.
5. Levator ſcapulæ.	From the tranſverſe proceſſes of the four uppermoſt vertebræ colli.	Into the upper angle of the ſcapula.	To move the ſcapula forwards and upwards.
6. Serratus ſuperior poſticus.	From the lower part of the ligamentum colli, the ſpinous proceſs of the lowermoſt cervical vertebra, and of the two ſuperior dorſal vertebræ.	Into the 2d, 3d, and 4th ribs.	To expand the thorax.
7. Splenius (o).	From the ſpinous proceſſes of the four or five uppermoſt vertebræ of the back, and of the lowermoſt cervical vertebra.	Into the tranſverſe proceſſes of the two firſt cervical vertebræ, the upper and back part of the maſtoid proceſs, and a ridge on the os occipitis.	To move the head backwards.
8. Complexus (p).	From the tranſverſe proceſſes of the four or five uppermoſt dorſal, and of the ſix lowermoſt cervical vertebræ.	Into the os occipitis.	To draw the head backwards.
9. Trachelo-maſtoideus (q).	From the tranſverſe proceſſes of the firſt dorſal vertebra, and four or five of the lowermoſt cervical vertebræ.	Into the maſtoid proceſs.	To draw the head backwards.
10. Rectus capitis poſticus major.	From the ſpinous proceſs of the ſecond cervical vertebra.	Into the os occipitis.	To extend the head and draw it backwards.
11. Rectus capitis poſticus minor.	From the firſt vertebra of the neck.	Into the os occipitis.	To aſſiſt the rectus major.
12. Obliquus ſuperior capitis.	From the tranſverſe proceſs of the firſt cervical vertebra.	Into the os occipitis.	To draw the head backwards.
13. Obliquus inferior capitis.	From the ſpinous proceſs of the ſecond cervical vertebra.	Into the tranſverſe proceſs of the firſt cervical vertebra.	To draw the face towards the ſhoulder, and to move the firſt vertebra upon the ſecond.
14. Sacro-lumbalis (r).	From the back part of the os ſacrum, ſpine of the ilium, ſpinous proceſſes, and roots of the tranſverſe proceſſes of the vertebræ of the loins.	Into the lower edge of each rib.	To draw the ribs downwards, move the body upon its axis, aſſiſt in erecting the trunk, and turn the neck backwards, or to one ſide.
15. Longiſſimus dorſi (s).	The ſame as that of the ſacro-lumbalis.	Into the tranſverſe proceſſes of the dorſal vertebræ.	To ſtretch the vertebræ of the back, & keep the trunk erect.
16. Spinalis dorſi.	From the ſpinous proceſſes of the uppermoſt lumbar and lowermoſt dorſal vertebræ.	Into the ſpinous proceſſes of the nine ſuperior dorſal vertebræ.	To extend the vertebræ.

Name.	*Origin.*	*Inſertion.*	*Uſe.*
17. Semi-ſpinalis dorſi.	From the tranſverſe proceſſes of the 7th, 8th, 9th, and 10th vertebræ of the back.	Into the ſpinous proceſſes of the four uppermoſt dorſal, and lowermoſt of the cervical vertebræ.	To extend the ſpine obliquely backwards.
18. Multifidus ſpinæ (t).	From the os ſacrum, ilium, oblique and tranſverſe proceſſes of the lumbar vertebræ, tranſverſe proceſſes of the dorſal, and four of the cervical vertebræ.	Into the ſpinous proceſſes of the lumbar, dorſal, and ſix of the cervical vertebræ.	To extend the back and draw it backwards, or to one ſide.
19. Semi-ſpinalis colli.	From the tranſverſe proceſſes of the five or ſix uppermoſt dorſal vertebræ.	Into the ſpinous proceſſes of the 2d, 3d, 4th, 5th, and 6th cervical vertebræ.	To ſtretch the neck obliquely backwards.
20. Scalenus (u).	From the tranſverſe proceſſes of the five inferior cervical vertebræ.	Into the upper and outer part of the firſt and ſecond ribs.	To move the neck forwards, or to one ſide.
21. Inter-ſpinales (x).	From the upper part of each of the ſpinous proceſſes of the ſix inferior cervical vertebræ.	Into the under part of each of the ſpinous proceſſes of the vertebræ above.	To draw the ſpinous proceſſes towards each other.
22. Inter-tranſverſales (y).	From the upper part of each of the tranſverſe proceſſes of the vertebræ.	Into the under part of each of the tranſverſe proceſſes of the vertebræ above.	To draw the tranſverſe proceſſes towards each other.

(210.) MUSCLES WITHIN THE CAVITY OF THE ABDOMEN, ON THE ANTERIOR AND LATERAL PARTS OF THE SPINE.

1. Pſoas parvus (z).	From the ſides and tranſverſe proceſſes of the uppermoſt lumbar vertebra, and ſometimes of the lowermoſt dorſal vertebræ.	Into the brim of the pelvis, at the junction of the os pubis with the ilium.	To bend the loins forwards.
2. Pſoas magnus.	From the bodies and tranſverſe proceſſes of the laſt dorſal, and all the lumbar vertebræ.	Into the os femoris, a little below the trochanter minor.	To bend the thigh forwards.
3. Iliacus internus.	From the inner lip, hollow part, and edge of the os ilium.	In common with the pſoas magnus.	To aſſiſt the pſoas magnus.
4. Quadratus lumborum (a).	From the poſterior part of the ſpine of the ilium.	Into the tranſverſe proceſſes of the four uppermoſt lumbar vertebræ, the inferior edge of the laſt rib, and the ſide of the lowermoſt dorſal vertebra.	To ſupport the ſpine, or to draw it to one ſide.
5. Coccygæus.	From the poſterior and inner edge of the ſpine of the iſchium.	Into the lower part of the os ſacrum, & almoſt the whole length of the os coccygis laterally.	To draw the os coccygis forwards and inwards (b).

(211.) MUSCLES ON THE SCAPULA AND UPPER PART OF THE OS HUMERI.

1. Deltoides (c).	From the clavicle, proceſſus acromion, and ſpine of the ſcapula.	Into the anterior and middle part of the os humeri.	To raiſe the arm.
2. Supra-ſpinatus.	From the baſis, ſpine, and upper coſta of the ſcapula.	Into a large tuberoſity at the head of the os humeri.	To raiſe the arm.
3. Infra-ſpinatus.	From the baſis and ſpine of the ſcapula.	Into the upper and middle part of the tuberoſity.	To roll the os humeri outwards.
4. Teres minor. (d).	From the inferior coſta of the ſcapula.	Into the lower part of the tuberoſity.	To aſſiſt the infra ſpinatus.
5. Teres major.	From the inferior angle, and inferior coſta of the ſcapula.	Into the ridge at the inſide of the groove formed for the long head of the biceps.	To aſſiſt in the rotatory motion of the arm.

Name.	*Origin.*	*Inſertion.*	*Uſe.*
6. Subſcapularis.	From the baſis, ſuperior and inferior coſtæ of the ſcapula.	Into the upper part of a ſmall tuberoſity at the head of the os humeri.	To roll the arm inwards.
7. Coraco-brachialis (*e*).	From the coracoid proceſs of the ſcapula.	Into the middle and inner ſide of the os humeri.	To roll the arm forwards and upwards.

(212.) MUSCLES ON THE OS HUMERI.

1. Biceps flexor cubiti.	By two heads, one from the coracoid proceſs, and the other, or long head, from the upper and outer edge of the glenoid cavity of the ſcapula.	Into the tuberoſity at the end of the radius.	To bend the fore-arm.
2. Brachialis internus.	From the os humeri, below, and at each ſide of the tendon of the deltoids.	Into a ſmall tuberoſity at the fore part of the coronoid proceſs of the ulna.	To aſſiſt in bending the fore arm.
3. Triceps extenſor cubiti.	By three heads; the firſt from the inferior coſta of the ſcapula; the ſecond, from the upper and outer part of the os humeri; and the third, from the back part of that bone.	Into the upper and outer part of the olecranon.	To extend the fore-arm.

(213.) MUSCLES ON THE FORE-ARM.

1. Supinator longus.	From the outer ridge and anterior ſurface of the os humeri, a little above its outer condyle.	Into the radius near its ſtyloid proceſs.	To aſſiſt in turning the palm of the hand upwards.
2. Extenſor carpi radialis longus.	Immediately below the origin of the ſupinator longus.	Into the upper part of the metacarpal bone of the middle finger.	To extend the wriſt.
3. Extenſor carpi radialis brevis.	From the outer and lower part of the outer condyle of the os humeri, and the upper part of the radius.	Into the upper part of the metacarpal bone of the middle finger.	To aſſiſt the extenſor longus.
4. Extenſor digitorum communis.	From the outer condyle of the os humeri.	Into the back part of all the bones of the four fingers.	To extend the fingers.
5. Extenſor minimi digiti.	From the outer condyle of the os humeri.	Into the bones of the little finger.	To extend the little finger.
6. Extenſor carpi ulnaris.	From the outer condyle of the os humeri.	Into the metacarpal bone of the little finger.	To aſſiſt in extending the wriſt.
7. Anconæus. (*f*).	From the outer condyle of the os humeri.	Into the outer edge of the ulna.	To extend the fore-arm.
8. Flexor carpi ulnaris.	From the inner condyle of the os humeri, and anterior edge of the olecranon (*g*).	Into the os piſiforme.	To aſſiſt in bending the hand.
9. Palmaris longus.	From the inner condyle of the os humeri.	Into the internal annular ligament, and aponeurofis palmaris (*b*).	To bend the hand.
10. Flexor carpi radialis.	From the inner condyle of the os humeri.	Into the metacarpal bone of the fore finger.	To bend the hand.
11. Pronator radii teres.	From the outer condyle of the os humeri, and coronoid proceſs of the ulna.	Into the anterior and convex edge of the radius, near its middle.	To roll the hand inwards.
12. Flexor ſublimis perforatus (*i*).	From the inner condyle of the os humeri, inner edge of the coronoid proceſs of the ulna, and upper and anterior part of the radius.	Into the ſecond bone of each finger.	To bend the ſecond joint of the fingers.

13. Supinator

Name.	*Origin.*	*Inſertion.*	*Uſe.*
13. Supinator radii brevis.	From the outer condyle of the os humeri, and poſterior ſurface and outer edge of the ulna.	Into the anterior, inner, and upper part of the radius.	To roll the radius outwards.
14. Abductor pollicis longus.	From the middle and back part of the ulna, interoſſeous ligament, and radius.	By two tendons into the os trapezium, and firſt bone of the thumb.	To ſtretch the firſt bone of the thumb outwards.
15. Extenſor minor policis.	From the back part of the ulna, and interoſſeus ligament and radius.	Into the convex part of the ſecond bone of the thumb.	To extend the ſecond bone of the thumb obliquely outwards.
16. Extenſor major policis.	From the back of the ulna and interoſſeous ligament.	Into the third and laſt bone of the thumb.	To ſtretch the thumb obliquely backwards.
17. Indicator.	From the middle of the ulna.	Into the metacarpal bone of the fore finger.	To extend the fore-finger.
18. Flexor profundus perforans.	From the upper and fore part of the ulna, and interoſſeous ligament.	Into the fore part of the laſt bone of each of the fingers.	To bend the laſt joint of the fingers.
19. Flexor longus pollicis.	From the upper and fore part of the radius.	Into the laſt joint of the thumb.	To bend the laſt joint of the thumb.
20. Pronator radii quadratus.	From the inner and lower part of the ulna.	Into the radius, oppoſite to its origin.	To roll the radius inwards, and of courſe to aſſiſt in the pronation of the hand.

(214.) MUSCLES ON THE HAND.

1. Lumbricales (*k*)	From the tendons of the perforans.	Into the tendons of the extenſor digitorum communis.	To bend the firſt, and to extend the two laſt joints of the fingers (*l*).
2. Abductor brevis pollicis.	From the fore part of the internal annular ligament, os ſcaphoides, and one of the tendons of the abductor longus pollicis.	Into the outer ſide of the ſecond bone of the thumb, near its root.	To move the thumb from the fingers.
3. Opponens pollicis.	From the inner and anterior part of the internal annular ligament, and from the os ſcaphoides.	Into the firſt bone of the thumb.	To move the thumb inwards, and to turn it upon its axis.
4. Flexor brevis pollicis.	From the os trapezoides, internal annular ligament, os magnum, and os unciforme.	Into the oſſa ſeſamoidea, and ſecond bone of the thumb.	To bend the ſecond joint of the thumb.
5. Abductor pollicis.	From the metacarpal bone of the middle finger.	Into the baſis of the ſecond bone of the thumb.	To move the thumb towards the fingers.
6. Abductor indicis.	From the inner ſide of the firſt bone of the thumb, and from the os trapezium.	Into the firſt bone of the fore finger poſteriorly.	To move the fore finger towards the thumb.
7. Palmaris brevis.	From the internal annular ligament, and aponeuroſis palmaris.	Into the os piſiforme, and the ſkin covering the abductor minimi digiti.	To contract the palm of the hand.
8. Abductor minimi digiti.	From the internal annular ligament, and os piſiforme.	Into the ſide of the firſt bone of the little finger.	To draw the little finger from the reſt.
9. Flexor parvus minimi digiti.	From the os unciforme and internal annular ligament.	Into the firſt bone of the little finger.	To bend the little finger.
10. Abductor metacarpi minimi digiti.	From the os unciforme and internal annular ligament.	Into the metacarpal bone of the little finger.	To move that bone towards the reſt.
11. Interoſſei interni.	Situated between the metacarpal bones.	Into the roots of the fingers.	To extend the fingers and move them towards the thumb (*m*).

Names.	*Origin.*	*Inſertion.*	*Uſe.*
12. Interoſſei externi.	From between the metacarpal bones on the back of the hand.	Into the roots of the fingers.	To extend the fingers; but the firſt draws the middle finger inwards, the ſecond draws it outwards, and the third draws the ring finger inwards.

(215.) MUSCLES AT THE BACK PART OF THE PELVIS, AND UPPER PART OF THE THIGH.

1. Glutæus (*n*) maximus.	From the ſpine of the ilium, poſterior ſacroiſchiatic ligaments, os ſacrum, and os coccygis.	Into the upper part of the *linea aſpera* of the os femoris.	To extend the thigh and draw it outwards.
2. Glutæus medius.	From the ſpine and ſuperior ſurface of the ilium.	Into the outer and back part of the great trochanter of the os femoris.	To draw the thigh outwards and a little backwards, and when it is bended, to roll it.
3. Glutæus minimus.	From the outer ſurface of the ilium, and the border of its great niche.	Into the upper and anterior part of the great trochanter.	To aſſiſt the former.
4. Pyriformis (*o*).	From the anterior part of the os ſacrum.	Into a cavity at the root of the trochanter major.	To roll the thigh outwards.
5. Gemini (*p*).	By two portions, one from the outer ſurface of the ſpine of the iſchium; the other from the tuberoſity of the iſchium and poſterior ſacro-iſchiatic ligament.	Into the ſame cavity as the pyriformis.	To roll the thigh outwards, and likewiſe to confine the tendon of the obturator internis, when the latter is in action.
6. Obturator internus.	From the ſuperior half of the inner border of the foramen thyroideum.	Into the ſame cavity with the former.	To roll the thigh outwards.
7. Quadratus (*q*) femoris.	From the tuberoſity of the iſchium.	Into a ridge between the trochanter major and trochanter minor.	To move the thigh outwards.

(216.) MUSCLES ON THE THIGH (*r*).

1. Biceps flexor.	By two heads; one for the tuberoſity of the iſchium, the other from the linea aſpera near the inſertion of the glutæus maximus.	Into the upper and back part of the fibula (*s*).	To bend the leg.
2. Semi-tendinoſus.	From the tuberoſity of the iſchium.	Into the upper and inner part of the tibia.	To bend and draw the leg inwards.
3. Semi-membranoſus.	From the tuberoſity of the iſchium.	Into the upper and back part of the head of the tibia.	To bend the leg.
4. Tenſor vaginæ femoris.	From the ſuperior and anterior ſpinous proceſs of the ilium.	Into the inner ſide of the faſcia lata, which covers the outſide of the thigh.	To ſtretch the faſcia.
5. Sartorius.	From the ſuperior and anterior ſpinous proceſs of the ilium.	Into the upper and inner part of the tibia.	To bend the leg inwards (*t*).
6. Rectus.	By two tendons; one from the anterior and inferior ſpinous proceſs of the ilium; the other from the poſterior edge of the cotyloid cavity.	Into the upper and fore part of the rotula.	To extend the leg.
7. Gracilis.	From the fore part of the iſchium and pubis.	Into the upper and inner part of the tibia.	To bend the leg.
8 Vaſtus externus (*x*).	From the anterior and lower part of the great trochanter, and the outer edge of the linea aſpera.	To the upper and outer part of the rotula.	To extend the leg.
9. Vaſtus internus.	From the inner edge of the linea aſpera, beginning between the fore part of the os femoris and the root of the leſſer trochanter.	Into the upper and inner part of the rotula.	To extend the leg.

10. Cruræus

Name.	*Origin.*	*Inſertion.*	*Uſe.*
10. Cruræus (*y*).	From the outer and anterior part of the leſſer trochanter.	Into the upper part of the rotula.	To extent the leg.
11. Pectinalis.	From the anterior edge of the os pubis, or pectinis, as it is ſometimes called.	Into the upper and fore part of the linea aſpera.	To draw the thigh inwards, upwards, and to roll it a little outwards.
12. Adductor longus femoris (*z*).	From the upper and fore part of the os pubis.	Near the middle and back of the linea aſpera.	To draw the thigh inwards, upwards, and to roll it a little outwards.
13. Adductor brevis femoris.	From the fore part of the ramus of the os pubis.	Into the inner and upper part of the linea aſpera.	
14. Adductor magnus femoris.	From the lower and fore part of the ramus of the os pubis.	Into the whole length of the linea aſpera.	
15. Obturator externus.	From part of the obturator ligament, and the inner half of the circumference of the foramen thyroideum.	Into the os femoris, near the root of the great trochanter.	To move the thigh outwards in an oblique direction, and likewiſe to bend and draw it inwards.

(217.) MUSCLES ON THE LEG.

1. Gaſtrocnemius (*aa*) externus.	By two heads; one from the inner condyle, the other from the outer condyle of the os femoris.	By a great round tendon, common to this and the following muſcle.	To extend the foot.
2. Gaſtrocnemius (*bb*) internus.	By two heads; one from the back part of the head of the fibula, the other from the upper and back part of the tibia.	By a large tendon (the *tendo Achillis*) common to this and the former muſcle, into the lower and back part of the os calcis.	To extend the foot.
3. Plantaris (*cc*).	From the upper and poſterior part of the outer condyle of the os femoris.	Into the inſide of the back part of the os calcis.	To aſſiſt in extending the foot.
4. Popliteus (*dd*).	From the outer condyle of the thigh.	Into the upper and inner part of the tibia.	To aſſiſt in bending the leg, and rolling it inwards.
5. Flexor longus digitorum pedis.	From the upper and inner part of the tibia.	By 4 tendons, which after paſſing through the perforations in thoſe of the flexor digitorum brevis, are inſerted into the laſt bone of all the toes, except the great toe.	To bend the laſt joint of the toe.
6. Flexor longus pollicis pedis.	From the back part, and a little below the head of the fibula.	Into the laſt bone of the great toe.	To bend the great toe.
7. Tibialis poſticus.	From the back part and outer edge of the tibia, and likewiſe from the interoſſeous ligament and adjacent part of the fibula.	Into the inner and upper part of the os naviculare, and ſide of the os cuneiforme medium.	To move the foot inwards.
8. Peroneus longus.	From the outer ſide of the head of the tibia, and alſo from the upper, anterior, and outer part of the *perone* or fibula, to which it adheres for a conſiderable way down.	Into the metatarſal bone of the great toe.	To move the foot outwards.
9. Peroneus brevis.	From the outer and fore part of the fibula.	Into the metatarſal bone of the little toe.	To aſſiſt the laſt deſcribed muſcle.
10. Extenſor longus digitorum pedis.	From the upper, outer, and fore part of the tibia, interoſſeous ligament, and inner edge of the fibula.	By four tendons into the firſt joint of the ſmaller toes.	To extend the toes.
11. Peroneus tertius.	From the fore part of the lower half of the fibula, and from the interoſſeous ligament.	Into the metatarſal bone of the little toe.	To bend the foot.

Name.	Origin.	Inſertion.	Uſe.
12. Tibialis anticus.	From the upper and fore part of the tibia.	Into the os cuneiforme internum.	To bend the foot.
13. Extenſor proprius pollicis pedis.	From the upper and fore part of the tibia.	Into the convex ſurface of the bones of the great toe.	To extend the great toe.

(218.) MUSCLES ON THE FOOT.

1. Extenſor brevis digitorum pedis.	From the upper and anterior part of the os calcis.	By 4 tendons, one of which joins the tendon of the externus longus pollicis, and the other three the tendons of the extenſor digitorum longus.	To extend the toes.
2. Flexor brevis digitorum pedis.	From the lower part of the os calcis.	By 4 tendons, which, after affording a paſſage to thoſe of the flexor longus, are inſerted into the ſecond phalanx of each of the ſmall toes.	To bend the ſecond joint of the toes.
3. Abductor pollicis pedis.	From the inner and lower part of the os calcis.	Into the firſt joint of the great toe.	To move the great toe from the other toes.
4. Abductor minimi digiti.	From the outer tubercle of the os calcis, the root of the metatarſal bone of the little toe, and alſo from the aponeuroſis plantaris.	Into the outer ſide of the firſt joint of the little toe.	To draw the little toe outwards.
5. Lumbricales pedis.	From the tendons of the flexor longus digitorum pedis.	Into the tendinous expanſion at the upper part of the toes.	To draw the toes inwards.
6. Flexor brevis pollicis pedis.	From the inferior and anterior part of the os calcis, and alſo from the inferior part of the os cunieforme externum.	By two tendons into the firſt joint of the great toe.	To bend the firſt joint of the great toe.
7. Adductor pollicis pedis.	From near the roots of the metatarſal bones of the 2d, 3d, and 4th toes.	Into the outer os ſeſamoideum, or firſt joint of the great toe.	To draw the great toe nearer to the reſt, and alſo to bend it.
8. Tranſverſales pedis.	From the outer and under part of the anterior end of the metatarſal bone of the little toe.	Into the inner os ſeſamoideum, and anterior end of the metatarſal bone of the great toe.	To contract the foot.
9. Flexor brevis minimi digiti pedis.	From the baſis of the metatarſal bone of the little toe.	Into the firſt joint of the little toe.	To bend the little toe.
10. Interoſſei pedis interni (*ff*). Interoſſei pedis externi (*gg*).	Situated between the metatarſal bones.		

(219.) NOTES referred to in the foregoing TABLE.

(A) Theſe are three ſmall ſlender muſcles. The inferior one is ſometimes wanting.

(B) The noſe is affected by the fibres of the occipito frontalis, and by ſeveral muſcles of the face; but this pair, the compreſſores, is the only one that is proper to it.

(C) This muſcle is in a great meaſure, if not wholly, formed by the buccinator, zygomatici, depreſſores, and other muſcles that move the lips. Its fibres ſurround the mouth like a ring.

(D) Some of its fibres likewiſe have their origin from a ſtrong faſcia that covers the muſcle, and adheres to the bone round the whole circumference of its origin. When we remove this covering, we find the muſcle of a ſemicircular ſhape, with its radiated fibres, converging and forming a ſtrong middle tendon.

(E) ſo called from its uſe in chewing, its derivation being *μασιαομαι*, *manduco*, to eat.

(F) This happens when the muſcle acts ſingly. When both act, the jaw is brought horizontally forwards.

(G)

(c) This broad and thin muſcular expanſion, which is ſituated immediately under the common integuments, is by Winſlow named *muſculus cutaneus*. Galen gave it the name of πλατυσμα μυωδες *(Platyſma myoides)*; the etymology of which is from πλατυνω, *dilatatio*, μυς, *muſculus*, and ειδος *forma*.

(d) This, on account of its two origins, is by Albinus deſcribed as two diſtinct muſcles, which he names *ſterno-maſtoideus* and *cleido-maſtoideus*.

(e) As this muſcle does not always ariſe from the coracoid proceſs, it ſeems to have been improperly named *coraco-hyoides*, by Douglas and Albinus. Winſlow calls it *omo-hyoideus* on account of its general origin from the ſcapula.

(f) From δις and γαστηρ *(biventer)*, becauſe it has two fleſhy bellies with a middle tendon. This tendon paſſes through the ſtylo-hyoideus.

(g) In ſome ſubjects we meet with another muſcle, which, from its having nearly the ſame origin, inſertion, and uſe as this, has been named *ſtylo-hyoideus alter*.

(h) So named from its ariſing near the dentes molares (μολαι), and its being inſerted into the os hyoides.

(i) From γενειον, *mentum*, the chin.

(o) From κερας, *cornu*, and γλωσσα, *lingua*, the tongue.

(p) This muſcle in its courſe forms a round tendon, which, after paſſing over a kind of hook formed by the inner plate of the pterygoid proceſs of the ſphenoid bone, expands into a tendinous membrane.

(q) The few fibres that ariſe from the Euſtachian tube are deſcribed as a diſtinct muſcle by Albinus, under the name of *ſalpingo-pharyngæus*. They ſerve to dilate the mouth of the tube.

(r) This muſcle, and the palato-pharyngæus, likewiſe ſerve to cloſe the paſſage into the fauces, and to carry the food into the pharynx.

(s) The three orders of fibres here mentioned, with a few others derived from the tongue, have given occaſion to Douglas to deſcribe them as four diſtinct muſcles under the names of *cephalo-pharyngæus*, *mylo-pharyngæus*, *pterygo-pharyngæus*, and *gloſſo-pharyngæus*.

(t) Douglas makes two muſcles of this, the *hyo-pharyngæus*, and *ſyndeſmo-pharyngæus*.

(u) The crico-pharyngæus and thyro-pharyngæus of Douglas.

(w) When either this or the preceding muſcle acts with its fellow, the epiglottis is drawn directly downwards upon the glottis.

(x) When both muſcles act, the neck is drawn directly forwards.

(y) The linea alba is that tendinous expanſion which reaches from the cartilago enſiformis to the os pubis. It is formed by the interlacement of the tendinous fibres of the oblique and tranſverſe muſcles, and on this account ſome anatomiſts have conſidered theſe as three digaſtric muſcles.

(z) A little above the pubis the tendinous fibres of this muſcle ſeparate from each other, ſo as to form an opening called the *ring* of the obliquus externus, and commonly, though improperly, the ring of the abdominal muſcles, there being no ſuch aperture either in the tranſverſalis or obliquus internus. This ring in the male ſubject affords a paſſage to the ſpermatic veſſels, and in the female to the round ligament of the uterus.

(a) From the anterior and upper ſpinous proceſs of the ilium, this muſcle is ſtretched tendinous to the os pubis, and thus forms what is called by ſome *Fallopius's*, and by others *Poupart's ligament*. The blood-veſſels paſs under it to the thigh.

(b) The tendon formed by the upper part of this muſcle, in its way to the linea alba, is divided into two layers. The poſterior layer runs under, and the anterior one over, the rectus muſcle.

(c) From this part it detaches ſome fibres, which extend downwards upon the ſpermatic chord, and form what is deſcribed as the cremaſter muſcle.

(d) The fibres of the rectus are generally divided by three tendinous interſections. The two upper thirds of this muſcle paſſing between the tendinous layers of the obliquus internus, are incloſed as it were in a ſheath; but at its lower part we find it immediately contiguous to the peritonæum, the inferior portion of the tendon of the tranſverſalis paſſing over the rectus, and adhering to the anterior layer of the obliquus internus.

(e) This muſcle is ſometimes wanting.

(f) The fibres of this muſcle paſs towards the axilla in a folding manner, and with thoſe of the latiſſimus dorſi form the arm-pit.

(g) This and ſome other muſcles derive their name of *ſerratus*, from their ariſing by a number of tendinous or fleſhy digitations, reſembling the teeth of a ſaw *(ſerra)*.

(h) For a deſcription of the diaphragm, ſee Part V. Sect. III. &c.

(i) The origin, inſertion, and uſe of the internal intercoſtals, are ſimilar to thoſe of the external. The reader, however, will be pleaſed to obſerve, that the intercoſtales externi, occupy the ſpaces between the ribs only from the ſpine to their cartilages; there being from thence to the ſternum, only a thin membrane, which is ſpread over the intercoſtales interni; and that the latter, on the contrary, extend only from the ſternum to the angles of each rib.

The fibres of the external muſcles run obliquely forwards; thoſe of the internal obliquely backwards. This difference in the direction of their fibres induced Galen to ſuppoſe that they were intended for different uſes; that the external intercoſtals, for inſtance, ſerve to elevate, and the internal ones to depreſs the ribs. Fallopius ſeems to have been the firſt who ventured to diſpute the truth of this doctrine, which has ſince been revived by Boyle, and more lately ſtill by Hamberger, whoſe theoretical arguments on this ſubject have been clearly refuted by the experiments of Haller.

(k) Theſe conſiſt of four, and ſometimes of five diſtinct muſcles on each ſide. Veſalius, and after him Douglas and Albinus, conſider them as forming a ſingle muſcle, which, on account of its ſhape, they name *triangularis*. Verheyen, Winſlow, and Haller, more properly deſcribe them as ſo many ſeparate muſcles, which, on account of their origin and inſertion, they name *ſterno-coſtales*.

(l)

(l) So named by Riolanus, from τραπεζα, on account of its quadrilateral ſhape. Columbus and others give it the name of *cucullaris*, from its reſemblance to a monk's hood.

(m) The tendinous fibres of this muſcle, united with thoſe of its fellow in the nape of the neck, form what is called the *ligamentum colli*.

(n) This muſcle conſiſts of two diſtinct portions, which are deſcribed as ſeparate muſcles by Albinus, under the names of *rhomboideus minor* and *rhomboideus major*.

(o) According to ſome writers, this muſcle has gotten its name from its reſemblance to the ſpleen; others derive it from *ſplenium ſplint*.

(p) So named on account of its complicated ſtructure.

(q) So named from its origin from the neck (τραχηλος) and its inſertion into the maſtoid proceſs.

(r) Several thin faſciculi of fleſhy fibres ariſe from the lower ribs, and terminate in the inner ſide of this muſcle. Steno names them *muſculi ad ſacro-lumbalem acceſſorii*. The ſacro lumbalis likewiſe ſends off a fleſhy ſlip from its upper part, which by Douglas and Albinus is deſcribed as a diſtinct muſcle, under the name of *cervicalis deſcendens*. Morgagni has very properly conſidered it as a part of the ſacro-lumbalis.

(s) At the upper part of this muſcle a broad thin layer of fleſhy fibres is found croſſing, and intimately adhering to it. This portion, which is deſcribed by Albinus, under the name of *tranſverſalis cervicis*, may very properly be conſidered as an appendage to the longiſſimus dorſi. It ariſes from the tranſverſe proceſſes of the five or ſix dorſal vertebræ, and is inſerted into the tranſverſe proceſſes of the ſix inferior cervical vertebræ. By means of this appendage the longiſſimus dorſi may ſerve to move the neck to one ſide, or obliquely backwards.

(t) Anatomiſts in general have unneceſſarily multiplied the muſcles of the ſpine. Albinus has the merit of having introduced greater ſimplicity into this part of myology. Under the name of *multifides ſpinæ*, he has very properly included thoſe portions of muſcular fleſh intermixed with tendinous fibres, ſituated cloſe to the back part of the ſpine, and which are deſcribed by Douglas under the names of *tranſverſus colli, dorſi, & lumborum*.

(u) The ancients gave it this name from its reſemblance to an irregular triangle (τριγωνος). It conſiſts of three fleſhy portions. The anterior one affords a paſſage to the axillary artery, and between this and the middle portion we find the nerves going to the upper extremities. The middle is in part covered by the poſterior portion, which is the longeſt and thinneſt of the three.

(x) In the generality of anatomical books we find theſe muſcles divided into *inter-ſpinales cervicis, dorſi*, and *lumborum*, but we do not find any ſuch muſcles either in the loins or back.

(y) Theſe muſcles are to be found only in the neck and loins; what have been deſcribed as the *inter-tranſverſales dorſi* being rather ſmall tendons than muſcles.

(z) This and the following pair of muſcles derive their name of ψοας from ψοα, *lumbus*, on account of their ſituation at the anterior part of the loins.

(a) So called from its ſhape which is that of an irregular ſquare.

(b) Some of the fibres of this muſcle are united with thoſe of the levator ani, ſo that it aſſiſts in cloſing the lower part of the pelvis.

(c) So named from its ſuppoſed reſemblance to the Greek Δ reverſed.

(d) This and the following pair are called *teres*, from their being of a long and round ſhape.

(e) This muſcle affords a paſſage to the muſculo-cutaneous nerve.

(f) So called from ωλενη, *cubitus*.

(g) Between the two origins of this muſcle we find the ulnar nerve going to the fore-arm.

(h) The aponeuroſis palmaris is a tendinous membrane that extends over the palm of the hand. Some anatomiſts have ſuppoſed it to be a production of the tendon of this muſcle, but without ſufficient grounds; for in ſome ſubjects we find the palmaris longus inſerted wholly into the annular ligament, ſo as to be perfectly diſtinct from this aponeuroſis; and it now and then happens that no palmaris longus is to be found, whereas this expanſion is never deficient.

(i) This muſcle is named *perforatus*, on account of the four tendons in which it terminates, being perforated by thoſe of another muſcle, the perforans.

(k) So named from their being ſhaped ſomewhat like the lumbricus or earth-worm.

(l) Fallopius was the firſt who remarked the two oppoſite uſes of this muſcle. Their extending power is owing to their connection with the extenſor communis.

(m) The third interoſſeus internus (for there are four of the externi and three of the interni) differs from the reſt in drawing the middle finger from the thumb.

(n) From γλουτος, *nates*.

(o) So named from its pear-like ſhape.

(p) The two portions of this muſcle having been deſcribed as two diſtinct muſcles by ſome anatomiſts, have occaſioned it to be named *gemini*. The tendon of the obturator internus runs between theſe two portions.

(q) That this muſcle is not of the ſquare ſhape, its name ſeems to indicate.

(r) The muſcles of the leg and thigh are covered by a broad tendinous membrane called *fascia lata*, that ſurrounds them in the manner of a ſheath. It is ſent off from the tendons of the glutæi and other muſcles, and dipping down between the muſcles it covers, adheres to the linea aſpera, and ſpreading over the joint of the knee, gradually diſappears on the leg. It is thickeſt on the inſide of the thigh.

(s) The tendon of this muſcle forms the *outer ham-ſtring*.

(t) So named on account of its origin, which is by a broad flat tendon three inches long.

(u) Spigelius was the firſt who gave this the name of *ſartorius*, or the taylor's muſcle, from its uſe in croſſing the legs.

(x) The vaſtus externus, vaſtus internus, and cruræus, are ſo intimately connected with each other, that ſome anatomiſts have been induced to conſider

Fig. 1.

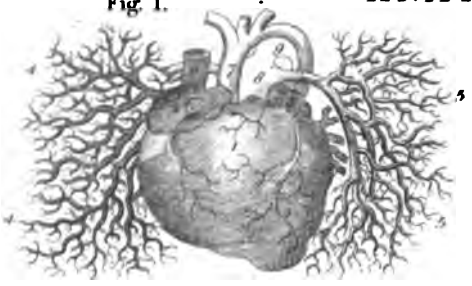

Fig. 2.

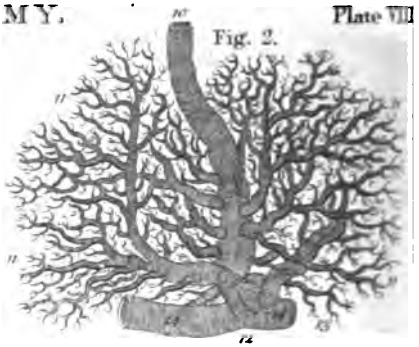

Fig. 4.

Fig. 3.

Fig. 5.

Fig. 6.

Fig. 1.

ABSORBENTS of the Lower Extremity

Fig. 2.

consider them as a *triceps*, or single muscle with three heads.

(*yy*) Under the cruræus we sometimes meet with two small muscles, to which Albinus has given the name *subcruræi*. They terminate on each side of the rotula, and prevent the capsular ligament from being pinched. When they are wanting, which is very often the case, some of the fibres of the cruræus are found adhering to the capsule.

(*zz*) This and the two following muscles have been usually, but improperly, considered as forming a single muscle with three heads, and on that account named *triceps femoris*.

(*aaa*) Παχυσφυρον, *furca*, the calf of the leg.

(*bb*) This muscle is by some anatomists named *solæus*, on account of its being shaped like the sole fish.

(*cc*) This muscle has gotten the name of *plantaris*, from its being supposed to furnish the aponeurosis that covers the sole of the foot; but it does not in the least contribute to the formation of that tendinous expansion.

(*dd*) So called on account of its situation at the ham (*poples*).

(*ee*) This muscle, about the middle of the foot, unites with a fleshy mass, which, from its having first been described by Sylvius, is usually called *accessoria carnea* JACOBI SYLVII.

(*ff*) The interossei interni are three in number; their use is to draw the smaller toes towards the great toe.

(*gg*) The interossei externi are four in number; the first serves to move the fore toe towards the great toe; the rest move the toes outwards. All the interossei assist in extending the toes.

EXPLANATION OF PLATES VI, VII, AND VIII.

(120.) FARTHER EXPLANATION OF PLATE VI.

FIG. 3. MUSCLES *of the* HEAD, FACE, NECK, &c. 1. Musculus frontalis. 2. Temporalis. 3. Orbicularis. 4. The parotid gland, with its duct, which passes through the buccinator. 5. Mastoideus. 6. Zygomaticus. 7. Elevator labii superioris proprius. 8. Elevator labiorum communis. 9. Depressor labiorum communis. 10. Sphincter oris. 11. Depressor labii inferioris proprius. 12. Buccinator. 13. Sterno-hyoidei. 14. Coracohyoideus. 15. Mastoideus. 16. Trapezius. 17. Pectoralis. 18. Deltoides.

FIG. 4. *A* POSTERIOR VIEW *of the* MUSCLES *of the* TRUNK. 1. Trapezius. 2. Deltoides. 3. Infra-spinatus scapulæ. 4. Teres major. 5. Rhomboides. 6. Latissimus dorsi. 7. Glutæi. 8. Obliquus descendens abdominis.

FIG. 5. *An* ANTERIOR VIEW *of the* VISCERA *in situ*. 1. Trachea. 2. The internal jugular vein. 3. The subclavian vein. 4. Cava descendens. 5. The right auricle of the heart. 6. The right ventricle. 7. Part of the left ventricle. 8. Aorta ascendens. 9. Arteria pulmonalis. 10. The right lobe of the lungs, part of which is cut off to shew the great blood-vessels. 11. The left lobe of the lungs. 12. The diaphragm. 13. The liver. 14. The ligamentum rotundum. 15. The gall-bladder. 16. The stomach, pressed by the liver towards the left side. 17. The small intestines. 18. The spleen.

FIG. 6. *A* VIEW *of the* POSTERIOR ABDOMINAL VISCERA. 1. The under side of the liver. 2. Ligamentum rotundum. 3. The gall-bladder. 4. The pancreas. 5. The spleen. 6. The kidney. 7. Aorta ascendens. 8. Vena cava ascendens. 9. The emulgent vein. 10. A probe under the spermatic vessels and the arteria mesenterica inferior, and over the ureters. 11. The ureter. 12. The iliac vessels. 13. The rectum intestinum. 14. The bladder of urine.

(121.) EXPLANATION OF PLATE VII.

MUSCLES *of the* UPPER EXTREMITY. 1. Musculus deltoides. 2. Pectoralis. 3. Biceps flexor cubiti. 4. Triceps extensor cubiti. 5. The fascia tendinosa of the biceps muscle. 6. Supinator radii longus. 7. Flexor carpi radialis. 8. Brachiæus internus. 9. Extensores carpi radiales. 10. Extensor communis digitorum. 11. Extensor carpi ulnaris. 12. Flexor carpi ulnaris. 13. Anconæus. 14. Extensor pollicis primus. 15. Extensor pollicis secundus.

MUSCLES *of the* LOWER EXTREMITY. 1. Membranosus. 2. Rectus femoris. 3. Vastus internus. 4. Vastus externus. 5. Sartorius. 6. Pectinæus. 7. Gastrocnemius. 8. Solæus. 9. Tibialis anticus. 10. Extensores digitorum. 11. Glutæus. 12. Biceps femoris. 13. Semitendinosus. 14. Semimembranosus. 15. Gastrocnemius.

ARTERIES *of the* UPPER EXTREMITY. 1. The humeral artery. 2. Cubitalis superior. 3. Cubitalis inferior, which ends in the hand and the fingers, and communicates with the cubitalis superior, under the muscles of the thumb. 4. The place where the cubitalis media is given off.

FIG. 1. *Represents the* SECOND LAYER *of the* MUSCLES *on the* BACK PART *of the* BODY.

HEAD *and* NECK. *a*, Temporalis; its tendon is seen passing below the zygoma. *b*, Masseter. *c*, Splenius capitis et colli. *d*, Portion of the complexus. *e*, Levator scapulæ, seu musculus patientiæ.

TRUNK. *a*, Rhomboides major. *b*, Rhomboides minor: and immediately above it the upper edge of the serratus posticus superior is seen. *c*, The serratus posticus superior on the right side. *d*, Serratus posticus inferior. *e*, Part of the spinalis dorsi. *f*, Part of the longissimus dorsi. *g*, Part of the sacrolumbalis. *h*, Serratus magnus. *i*, The broad tendon, by which the latissimus dorsi begins, and from which the tendon of the serratus posticus inferior is inseparable. *k*, Part of the obliquus internus ascendens abdominis. *l*, The sphincter ani, fixed to the point of the coccygis; at the side of which the coccygæus, and a portion of the levator ani are seen, and lower down, opposite to *l*, part of the transversalis perinæi.

SUPERIOR EXTREMITY. *a*, Supra-spinatus. *b*, Infra-spinatus. *c*, Teres minor. *d*, Teres major. *e*, Triceps extensor cubiti. *f*, Its head cal-

(l) So named by Riolanus, from τραπεζα, on account of its quadrilateral ſhape. Columbus and others give it the name of *cucullaris*, from its reſemblance to a monk's hood.

(m) The tendinous fibres of this muſcle, united with thoſe of its fellow in the nape of the neck, form what is called the *ligamentum colli*.

(n) This muſcle conſiſts of two diſtinct portions, which are deſcribed as ſeparate muſcles by Albinus, under the names of *rhomboideus minor* and *rhomboideus major*.

(o) According to ſome writers, this muſcle has gotten its name from its reſemblance to the ſpleen; others derive it from *ſplenium ſplint*.

(p) So named on account of its complicated ſtructure.

(q) So named from its origin from the neck (τραχηλος) and its inſertion into the maſtoid proceſs.

(r) Several thin faſciculi of fleſhy fibres ariſe from the lower ribs, and terminate in the inner ſide of this muſcle. Steno names them *muſculi ad ſacro-lumbalem acceſſorii*. The ſacro lumbalis likewiſe ſends off a fleſhy ſlip from its upper part, which by Douglas and Albinus is deſcribed as a diſtinct muſcle, under the name of *cervicalis deſcendens*. Morgagni has very properly conſidered it as a part of the ſacro-lumbalis.

(s) At the upper part of this muſcle a broad thin layer of fleſhy fibres is found croſſing, and intimately adhering to it. This portion, which is deſcribed by Albinus, under the name of *tranſverſalis cervicis*, may very properly be conſidered as an appendage to the longiſſimus dorſi. It ariſes from the tranſverſe proceſſes of the five or ſix dorſal vertebræ, and is inſerted into the tranſverſe proceſſes of the ſix inferior cervical vertebræ. By means of this appendage the longiſſimus dorſi may ſerve to move the neck to one ſide, or obliquely backwards.

(t) Anatomiſts in general have unneceſſarily multiplied the muſcles of the ſpine. Albinus has the merit of having introduced greater ſimplicity into this part of myology. Under the name of *multifides ſpinæ*, he has very properly included thoſe portions of muſcular fleſh intermixed with tendinous fibres, ſituated cloſe to the back part of the ſpine, and which are deſcribed by Douglas under the names of *tranſverſus colli, dorſi, & lumborum*.

(u) The ancients gave it this name from its reſemblance to an irregular triangle (σκαληνος). It conſiſts of three fleſhy portions. The anterior one affords a paſſage to the axillary artery, and between this and the middle portion we find the nerves going to the upper extremities. The middle is in part covered by the poſterior portion, which is the longeſt and thinneſt of the three.

(x) In the generality of anatomical books we find theſe muſcles divided into *inter-ſpinales cervicis, dorſi*, and *lumborum*, but we do not find any ſuch muſcles either in the loins or back.

(y) Theſe muſcles are to be found only in the neck and loins; what have been deſcribed as the *inter-tranſverſales dorſi* being rather ſmall tendons than muſcles.

(z) This and the following pair of muſcles derive their name of ρομβος from ψομβος, *lumbus*, on account of their ſituation at the anterior part of the loins.

(a) So called from its ſhape which is that of an irregular ſquare.

(b) Some of the fibres of this muſcle are united with thoſe of the levator ani, ſo that it aſſiſts in cloſing the lower part of the pelvis.

(c) So named from its ſuppoſed reſemblance to the Greek Δ reverſed.

(d) This and the following pair are called *teres*, from their being of a long and round ſhape.

(e) This muſcle affords a paſſage to the muſculo-cutaneous nerve.

(f) So called from ωλενη, *cubitus*.

(g) Between the two origins of this muſcle we find the ulnar nerve going to the fore-arm.

(h) The aponeuroſis palmaris is a tendinous membrane that extends over the palm of the hand. Some anatomiſts have ſuppoſed it to be a production of the tendon of this muſcle, but without ſufficient grounds; for in ſome ſubjects we find the palmaris longus inſerted wholly into the annular ligament, ſo as to be perfectly diſtinct from this aponeuroſis; and it now and then happens that no palmaris longus is to be found, whereas this expanſion is never deficient.

(i) This muſcle is named *perforatus*, on account of the four tendons in which it terminates, being perforated by thoſe of another muſcle, the perforans.

(k) So named from their being ſhaped ſomewhat like the lumbricus or earth-worm.

(l) Fallopius was the firſt who remarked the two oppoſite uſes of this muſcle. Their extending power is owing to their connection with the extenſor communis.

(m) The third interoſſeus internus (for there are four of the externi and three of the interni) differs from the reſt in drawing the middle finger from the thumb.

(n) From γλουτος, *nates*.

(o) So named from its pear-like ſhape.

(p) The two portions of this muſcle having been deſcribed as two diſtinct muſcles by ſome anatomiſts, have occaſioned it to be named *gemini*. The tendon of the obturator internus runs between theſe two portions.

(q) That this muſcle is not of the ſquare ſhape, its name ſeems to indicate.

(r) The muſcles of the leg and thigh are covered by a broad tendinous membrane called *faſcia lata*, that ſurrounds them in the manner of a ſheath. It is ſent off from the tendons of the glutæi and other muſcles, and dipping down between the muſcles it covers, adheres to the linea aſpera, and ſpreading over the joint of the knee, gradually diſappears on the leg. It is thickeſt on the inſide of the thigh.

(s) The tendon of this muſcle forms the *outer ham-ſtring*.

(t) So named on account of its origin, which is by a broad flat tendon three inches long.

(u) Spigelius was the firſt who gave this the name of *ſartorius*, or the taylor's muſcle, from its uſe in croſſing the legs.

(x) The vaſtus externus, vaſtus internus, and cruræus, are ſo intimately connected with each other, that ſome anatomiſts have been induced to conſider

Muscles. *Arteries.*

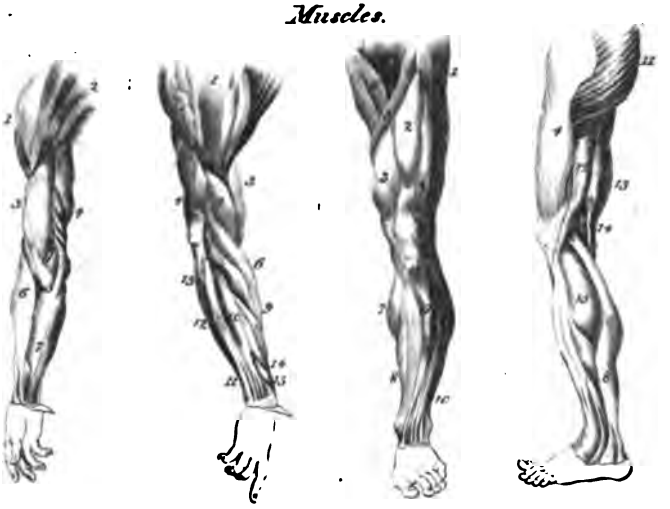

Fig. 3.

Fig. 5.

Fig. 4

Fig. 1.

Fig. 2.

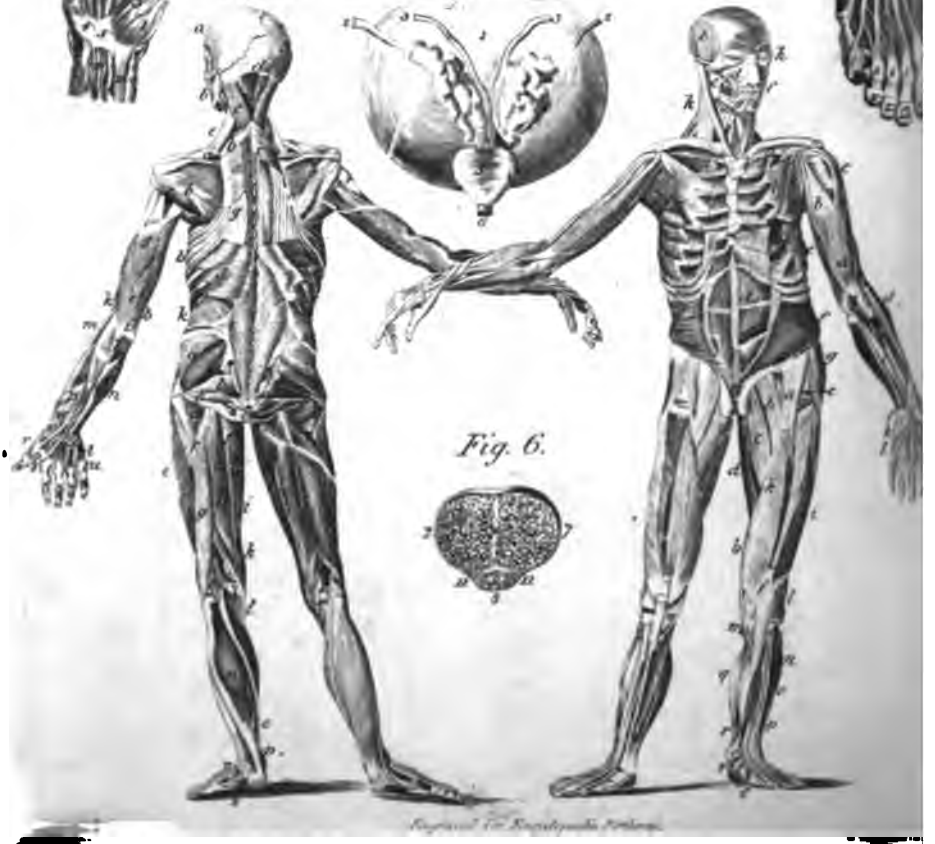

Fig. 6.

Fig. 1.

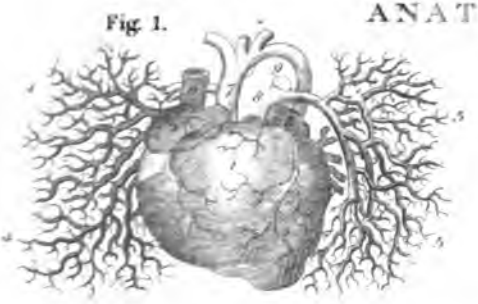

Fig. 2.

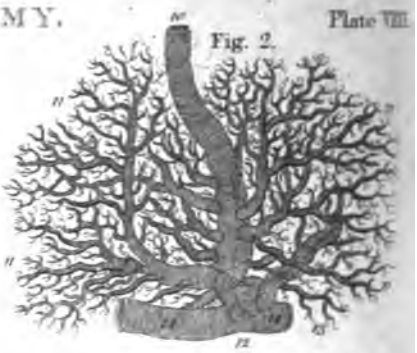

Fig. 4.

Fig. 3.

Fig. 5.

Fig. 6.

Fig. 1.

ABSORBENTS of the Lower Extremity

Fig. 2.

conſider them as a *triceps*, or ſingle muſcle with three heads.

(*y*) Under the cruræus we ſometimes meet with two ſmall muſcles, to which Albinus has given the name *ſubcruræi*. They terminate on each ſide of the rotula, and prevent the capſular ligament from being pinched. When they are wanting, which is very often the caſe, ſome of the fibres of the cruræus are found adhering to the capſula.

(*z*) This and the two following muſcles have been uſually, but improperly, conſidered as forming a ſingle muſcle with three heads, and on that account named *triceps femoris*.

(*aa*) Ταρσομηρικὸς, *ſura*, the calf of the leg.

(*bb*) This muſcle is by ſome anatomiſts named *ſoleus*, on account of its being ſhaped like the ſole fiſh.

(*cc*) This muſcle has gotten the name of *plantaris*, from its being ſuppoſed to furniſh the aponeuroſis that covers the ſole of the foot; but it does not in the leaſt contribute to the formation of that tendinous expanſion.

(*dd*) So called on account of its ſituation at the ham (*poples*).

(*ee*) This muſcle, about the middle of the foot, unites with a fleſhy maſs, which, from its having firſt been deſcribed by Sylvius, is uſually called *maſſa carnea* JACOBI SYLVII.

(*ff*) The interoſſei interni are three in number; their uſe is to draw the ſmaller toes towards the great toe.

(*gg*) The interoſſei externi are four in number; the firſt ſerves to move the ſore toe towards the great to toe; the reſt move the toes outwards. All the interoſſei aſſiſt in extending the toes.

EXPLANATION OF PLATES VI, VII, AND VIII.

(120.) FARTHER EXPLANATION OF PLATE VI.

FIG. 3. MUSCLES *of the* HEAD, FACE, NECK, &c. 1. Muſculus frontalis. 2. Temporalis. 3. Orbicularis. 4. The parotid gland, with its duct, which paſſes through the buccinator. 5. Maſtoideus. 6. Zygomaticus. 7. Elevator labii ſuperioris proprius. 8. Elevator labiorum communis. 9. Depreſſor labiorum communis. 10. Sphincter oris. 11. Depreſſor labii inferioris proprius. 12. Buccinator. 13. Sterno-hyoidei. 14. Coraco-hyoideus. 15. Maſtoideus. 16. Trapezius. 17. Pectoralis. 18. Deltoides.

FIG. 4. *A* POSTERIOR VIEW *of the* MUSCLES *of the* TRUNK. 1. Trapezius. 2. Deltoides. 3. Infra-ſpinatus ſcapulæ. 4. Teres major. 5. Rhomboides. 6. Latiſſimus dorſi. 7. Glutæi. 8. Obliquus deſcendens abdominis.

FIG. 5. *An* ANTERIOR VIEW *of the* VISCERA *in ſitu*. 1. Trachea. 2. The internal jugular vein. 3. The ſubclavian vein. 4. Cava deſcendens. 5. The right auricle of the heart. 6. The right ventricle. 7. Part of the left ventricle. 8. Aorta aſcendens. 9. Arteria pulmonalis. 10. The right lobe of the lungs, part of which is cut off to ſhew the great blood-veſſels. 11. The left lobe of the lungs. 12. The diaphragm. 13. The liver. 14. The ligamentum rotundum. 15. The gall-bladder. 16. The ſtomach, preſſed by the liver towards the left ſide. 17. The ſmall inteſtines. 18. The ſpleen.

FIG. 6. *A* VIEW *of the* POSTERIOR ABDOMINAL VISCERA. 1. The under ſide of the liver. 2. Ligamentum rotundum. 3. The gall-bladder. 4. The pancreas. 5. The ſpleen. 6. The kidney. 7. Aorta aſcendens. 8. Vena cava aſcendens. 9. The emulgent vein. 10. A probe under the ſpermatic veſſels and the arteria meſenterica inferior, and over the ureters. 11. The ureter. 12. The iliac veſſels. 13. The rectum inteſtinum. 14. The bladder of urine.

(121.) EXPLANATION OF PLATE VII.

MUSCLES *of the* UPPER EXTREMITY. 1. Muſculus deltoides. 2. Pectoralis. 3. Biceps flexor cubiti. 4. Triceps extenſor cubiti. 5. The facia tendinola of the biceps muſcle. 6. Supinator radii longus. 7. Flexor carpi radialis. 8. Brachiæus internus. 9. Extenſores carpi radiales 10. Extenſor communis digitorum. 11. Extenſor carpi ulnaris. 12. Flexor carpi ulnaris. 13. Anconæus. 14. Extenſor pollicis primus. 15. Extenſor pollicis ſecundus.

MUSCLES *of the* LOWER EXTREMITY. 1. Membranoſus. 2. Rectus femoris. 3. Vaſtus internus. 4. Vaſtus externus. 5. Sartorius. 6. Pectinæus. 7. Gaſtrocnemius. 8. Solæus. 9. Tibialis anticus. 10. Extenſores digitorum. 11. Glutæus. 12. Biceps femoris. 13. Semitendinoſus. 14. Semimembranoſus. 15. Gaſtrocnemius.

ARTERIES *of the* UPPER EXTREMITY. 1. The humeral artery. 2. Cubitalis ſuperior. 3. Cubitalis inferior, which ends in the hand and the fingers, and communicates with the cubitalis ſuperior, under the muſcles of the thumb. 4. The place where the cubitalis media is given off.

FIG. 1. *Repreſents the* SECOND LAYER *of the* MUSCLES *on the* BACK PART *of the* BODY.

HEAD *and* NECK. *a*, Temporalis; its tendon is ſeen paſſing below the zygoma. *b*, Maſſeter. *c*, Splenius capitis et colli. *d*, Portion of the complexus. *e*, Levator ſcapulæ, ſeu muſculus patientiæ.

TRUNK. *a*, Rhomboides major. *b*, Rhomboides minor: and immediately above it the upper edge of the ſerratus poſticus ſuperior is ſeen. *c*, The ſerratus poſticus ſuperior on the right ſide. *d*, Serratus poſticus inferior. *e*, Part of the ſpinalis dorſi. *f*, Part of the longiſſimus dorſi. *g*, Part of the ſacrolumbalis. *h*, Serratus magnus. *i*, The broad tendon, by which the latiſſimus dorſi begins, and from which the tendon of the ſerratus poſticus inferior is inſeparable. *k*, Part of the obliquus internus aſcendens abdominis. *l*, The ſphincter ani, fixed to the point of the coccygis; at the ſide of which the coccygæus, and a portion of the levator ani are ſeen, and lower down, oppoſite to *l*, part of the tranverſalis penis.

SUPERIOR EXTREMITY. *a*, Supra-ſpinatus. *b*, Infra-ſpinatus. *c*, Teres minor. *d*, Teres major. *e*, Triceps extenſor cubiti. *f*, Its head call-

ed longus. *g*, The brevis. *b*, A ſmall portion of the third head, named Brachialis Externus. *i*, The tendon of triceps, inſerted into the olecranon. *k*, Part of the brachialis internus. And *l*, conæus, which ſeems to be continued from that part of the brachalias externus immediately above it. *m*, Extenſor carpi radialis longior; and beneath it the brevior; both are ſeen at the wriſt, inſerted into the metacarpal bones of the fore and middle fingers. *n*, Flexor carpi ulnaris. *o*, Part on the ſupinator radii brevis. *p*, Extenſor oſſis metacarpi pollicis manus. *q*, Extenſor primi internodii pollicis manus. *r*, Extenſor ſecundi internodii pollicis manus. *s*, Indicator, inſerted into the root of the firſt joint of the fore finger. *t*, One of the three external interoſſei manus. The other two are diſtinctly ſeen without letters. *u*, One of the tendons of the extenſors of the fingers cut; and the ſame is ſeen in each of the other three fingers, joining with the tendons and aponeuroſes of the interoſſei and lumbricales, and ſpread upon the back of the fingers.

On the right hand, part of the flexors of the fingers, the abductor pollicis, and minimi digiti, are ſeen.

INFERIOR EXTREMITY. *a*, Gluteus medius. *b*, Pyriformis. *c*, The two muſcles called Gemini, between which the tendon of the obturator internus paſſes over the tuberoſity of the os iſchium: and its fleſhy belly is ſeen within the pelvis, partly covered by the coccygæus and levator ani. *d*, Quadratus femoris. *e*. Vaſtus externus. *f*, *f*, Parts of the triceps magnus. *g*, Long head of the triceps flexor cruris; and beneath it part of the ſhort head is ſeen. *b*, Semitendinoſus, and beneath it parts of the ſemimembranoſus are ſeen on each ſide of it. *i*, Gracilis. *k*, A ſmall portion of the vaſtus internus. *l*. Popliteus. *m*, The fleſhy belly of the plantaris; and its long ſlender tendon is ſeen paſſing over the inſide of the ſoleus. *n*, Soleus. *o*, The place where the tendon of the gemellus was cut off; but the fleſh of the ſoleus runs further down. *p*, Tendo achillis, with the plantaris. *q*, Peroneus longus, paſſing at the outer ancle to the ſole of the foot; beneath it, the peroneus brevis to the root of the metatarſal bone of the little toe; and between it and the tendo achillis, a portion of the flexor longus digitorum pedis. *r*, Tendons of the extenſor longus digitorum pedis, with the peroneus tertius; and beneath theſe, the extenſor brevis digitorum pedis. *s*, Flexor brevis minimi digiti pedis.

FIG. 2. *Repreſents the* SECOND LAYER *of* MUSCLES, *on the* ANTERIOR PART *of the* WHOLE BODY.

MUSCLES *ſituated on the* HEAD *and* NECK. *a*, Corrugator ſupercilii. *b*, Temporalis. *c*, Maſſeter. *d*, Levator anguli oris. *e*, Buccinator. *f*, Orbicularis oris. Oppoſite to the right ala naſi, is the portion of this muſcle which Albinus names Naſalis labii ſuperioris. *g*, Depreſſor labii inferioris. *b*, Sterno-cleido-maſtoideus, which is ſeen below, ariſing from the ſternum and clavicle, by two heads. *i*, Sterno-hyoideus. On the outſide of it, the omo-hyoideus Further out, a portion of the hyo-thyroideus. *k*, Levator ſcapulæ.

TRUNK. *a*, Subclavius. *b*, Pectoralis minor. *c*, Serratus magnus. *d*, Rectus abdominis, divided into ſeveral fleſhy portions by it's tendinous interſections. *e*, Pyramidalis. *f*, Obliquus aſcendens internus. *g*, Spermatic cord, with the origin of the cremaſter muſcle.

SUPERIOR EXTREMITY. *a*, Biceps flexor cubiti. *b*, Short head of the biceps. Beneath the upper part of it, a portion of the coraco-brachialis. Beneath the under part, a portion of the brachialis internus. *c*, Long head of the biceps. At the bending of the arm, the tendon of the biceps, and the place where the tendinous aponeuroſis was cut from it, are ſeen. *d*, Extenſor carpi radialis longior. Beneath it a portion of the extenſor carpi radialis brevior. *e*, Flexor ſublimis perforatus. *f*, Inſertion of the extenſor carpi ulnaris. *g*, Extenſor of the thumb. *b*, Opponens pollicis. On the inſide of it, is a portion of the flexor pollicis brevis. *i*, Tendon of the flexor longus pollicis manus, after paſſing through the flexor brevis pollicis manus. *k*, Abductor minimi digiti manus. *l*, Flexor parvus minimi digiti manus. *m*, Ligamentum carpi annulare.

INFERIOR EXTREMITY. *a*, Iliacus internus. Between *a* and *b*, part of the pſoas magnus. *b*, Pectinalis. *c*, Triceps longus. *d*, Gracilis. *e*, Rectus cruris, cut off near its origin. *f*, Tendon of the rectus cruris cut off above the patella, from which a ſtrong tendon is ſent to be inſerted into the tubercle of the tibia. *g*, Portion of the gluteus medius. On the inſide of it, is part of the gluteus minimus. *b*, Vaſtus internus. *i*, Vaſtus externus. *k*, Crureus. *l*, Inſertion of the biceps flexor cruris into the fibula. *m*, Tendons of the gracilis and ſemitendinoſus inſerted into the tibia. *n*, Soleus. *o*, Peroneus longus. *p*, Extenſor longus digitorum, with the peroneus tertius on the outſide, and extenſor pollicis proprius on the inſide. *q*, Soleus. *r*, Flexor longus digitorum. *s*, Tendons of the tibialis poſticus and flexor longus digitorum pedis. *t*, Flexor brevis digitorum pedis.

FIG. 3. MUSCLES *and* TENDONS *of the* INSIDE *of the* HAND.

1. Muſculus abductor pollicis. 2. Abductor pollicis. 3. Flexor brevis. *b*. Quadratus, or palmaris brevis. The ſtrong ligament of the carpus, that binds down the tendons of the flexors of the fingers. 6. Abductor minimi digiti. 7. A probe thruſt under the tendons of the perforatus. 8. A probe under thoſe of the perforans. 6. Lumbricales. 10. Perforatus. 11. Flexor carpi radialis. 12. Flexor carpi ulnaris.

FIG. 4. MUSCLES *and* TENDONS *of the* FORE PART *of the* FOOT.

A. Tendo achillis. 2, That part of the aſtragalus which articulates with the tibia. 3. The tendon of the tibialis anticus. 4. Tendon of the extenſor pollicis pedis longus. 5. Tendons of the extenſor digitorum communis. 6. Extenſor pollicis pedis brevis. 7. Extenſor digitorum brevis. 8. The union of the tendons of the extenſor longus and the extenſor brevis.

FIG. 5. *A* VIEW *of the* BLADDER *and its* APPENDAGES.

1. The under ſide of the bladder. 2. The ureters,

reters. 3. Vaſa deferentia. 4. Veſiculæ ſeminales. 5. The proſtate gland. 6. Meatus urinarius.

FIG. 6. *A* TRANSVERSE SECTION *of the* PENIS.

7. The corpora cavernoſa penis. 8. Corpus cavernoſum urethræ. 9. Urethra. 10. Septum penis. 11. The ſeptum between the corpus cavernoſum urethra, and that of the penis.

(224.) EXPLANATION OF PLATE VIII. FIG. 1 & 2.

SUPERFICIAL ABSORBENTS *of the* LOWER EXTREMITY. A, The ſpine of the os ilium. B, The os pubis. C, The iliac artery. D, The knee. E, E, F, Branches of the crural artery. G, The muſculous gaſtrocnemius. H, The tibia. I, The tendon of the muſculous tibialis anticus. *On the outlines*, &c. A lymphatic veſſel belonging to the top of the foot. b, Its firſt diviſion into branches. c, c, c, Other diviſions of the ſame lymphatic veſſel. d, A ſmall lymphatic gland. e, The lymphatic veſſels which lie between the ſkin and the muſcles of the thigh. f, f, Two lymphatic glands at the upper part of the thigh below the groin. g, g, Other glands. h, A lymphatic veſſel which paſſes by the ſide of thoſe glands without communicating with them; and, bending towards the inſide of the groin at i, opens into the lymphatic gland. k, Lymphatic glands appear in the groin, which are common to the lymphatic veſſels of the genitals and thoſe of the lower extremity; and alſo a plexus of lymphatic veſſels paſſing on the inſide of the iliac artery.

POSTERIOR VIEW *of the* LOWER EXTREMITY, *diſſected ſo as to ſhow the deeper ſeated* LYMPHATIC VESSELS, *which accompany the arteries*. A, The os pubis. B, The tuberoſity of the iſchium. C, That part of the os ilium which was articulated with the os ſacrum. D, the extremity of the iliac artery appearing above the groin. E, The knee. F, F, The two cut ſurfaces of the triceps muſcle, which was divided to ſhow the lymphatic veſſels that paſs through its perforation along with the crural artery. G, the edge of the muſculus gracilis. H, The gaſtrocnemius and ſoleus, much ſhrunk by being dried, and by the ſoleus being ſeparated from the tibia to expoſe the veſſels. I, The heel. K, The ſole of the foot. The ſuperficial lymphatic veſſels appear paſſing over the knee to get to the thigh.

PART II. EXTERNAL SARCOLOGY, AND ADENOLOGY.

INTRODUCTORY OBSERVATIONS.

(223.) THE different parts of the human body are ſo various, and ſo complicated, in their ſubſtance, as well as in their forms, and at the ſame time ſo neceſſarily connected together, by their relative ſituations, uſes, &c. that it is difficult, if not impoſſible, to form any general arrangement, ſo diſtinct as to diſtribute each part into its different claſſes, and yet ſo comprehenſive, as to include the whole under their reſpective diviſions, without repetitions and tautologies. Thus, for, inſtance, the heart being a *muſcle*, ought to be claſſed under *Myology*, and the liver being a *gland*, ſhould be ranked under *Adenology*; but both theſe important organs, being ſituated within the great cavities of the body, are generally arranged by anatomiſts, not according to their ſpecific nature, but agreeably to their ſituation: the former being deſcribed along with the other contents of the thorax, and the latter amongſt the abdominal viſcera. It is doubtleſs owing to theſe difficulties, attending a ſtrict propriety of arrangement, that, although, in the introductions to moſt anatomical treatiſes, SARCOLOGY, and its ſubdiviſions, MYOLOGY, ADENODOGY, SPLANCHNOLOGY, &c. are mentioned as proper diviſions of Anatomy, yet, we ſeldom or never find the parts arranged under them, in the courſe of ſuch works; or indeed, any farther notice taken of any anatomical branch, excepting OSTEOLOGY, and ſometimes ANGEIOLOGY. And, therefore, although we have deviated ſo far from general cuſtom as to adopt a mode of arrangement, different, in this reſpect, from our predeceſſors, yet we would not wiſh the reader to expect from the title ADENOLOGY, at the head of this part of the work, a particular account of *every gland* in the human body, as ſome of them fall neceſſarily to be noticed elſewhere.

SECT. I. GENERAL DIVISON *of the* TRUNK.

(224.) THE human body is divided into three great cavities. Of theſe the uppermoſt is formed by the bones of the cranium, and incloſes the brain and cerebellum. The 2d is compoſed of the vertebræ of the back, the ſternum, and true ribs, with the additional aſſiſtance of muſcles, membranes, and common integuments, and is called the thorax. It contains the heart, lungs, &c. The 3d, and inferior cavity, is the abdomen. It is ſeparated from the thorax, by means of the diaphragm, and is formed by the lumbar vertebræ, the os ſacrum, the oſſa innominata, and the falſe ribs, to which we may add the peritonæum, and a variety of muſcles. This cavity incloſes the ſtomach, inteſtines, omentum or cawl, liver, pancreas, ſpleen, kidneys, urinary bladder, and parts of generation.

(225.) The hollow on the middle and inferior part of the thorax, below the breaſts, is called *ſcrobiculus cordis*. The middle of the abdomen, for about three fingers breadth, above and below the navel, is called *regio umbilicalis*; the middle part above this, *epigaſtrium*; on each ſide of the epigaſtrium, under the cartilages of the lower ribs, *hypochondrium*; and from below the regio umbilicalis, down to the oſſa ilia and oſſa pubis, *hypogaſtrium*.

SECT. II. *Of the* COMMON INTEGUMENTS.

(226.) UNDER the title EXTERNAL SARCOLOGY, we mean to comprehend, chiefly, the common integuments and membranes, with their appendages; amongſt which, one branch of adenology, viz. the cutaneous glands, falls naturally to be conſidered. In the diviſion of common integuments, are uſually included the epidermis, or ſcarf-ſkin, the reticulum mucoſum of Malpighi, the cutis or true ſkin, and the membrana adipoſa. The hair and nails, as well as the ſebaceous glands, may alſo be conſidered as appendages to the ſkin.

(227.) The CUTICULA, EPIDERMIS, or SCARF-SKIN, is that thin insensible membrane, which is raised by Blisters in living bodies. It is extended over every part of the true skin, unless where the nails are. It appears when viewed in a microscope, a very fine smooth membrane, only with some inequality of surface, where the *rete mucosum* adheres to it. When we examine narrowly the small passages through which the sebaceous matter of the skin passes, the cuticle seems to enter these, in order to complete the secretory tubes. The fossulæ of the hairs have likewise the same productions of the cuticle, and it seems to give a kind of covering to the hair themselves. Lastly, the almost imperceptible ducts of the cutaneous pores are lined by it. Its use is to defend the true skin, that it may not be exposed to pain from whatever it touches; and also to preserve it from wearing. It is thickest on those parts of the bottom of the foot, which sustain the body, and on the hands of persons much used to labour, being so contrived by nature as to grow the thicker the more those parts are used. In eruptive diseases, the cuticula will sometimes become scurfy, and full of little breaches, which are apt to remain even when the cause is taken away; but if the cuticle be taken off by a blister, the cuticla will be produced in a sound state.

(228.) The RETE MUCOSUM is a substance of a greyish colour, situated under the epidermis, which has been thought to represent a net-work; hence it has got the name of *rete mucosum*. It is of a soft, mucilaginous, and viscid nature; and fills up the interstices of the fibres running between the cutis vera and cuticula. After raising the cuticle in a negro, where it is thickest and most distinct, this substance appears of a black colour, and is composed of two distinct layers. It is this that chiefly gives the colour to the skin; for it is black in the African; white, brown, or yellowish, in the European. The origin of this mucous substance has not hitherto been sufficiently explained; nor has it been fully determined what purposes it serves in the human body. Haller thinks it probable, that it is composed of a humour transuding from the surface of the cutis vera.

(229.) The CUTIS VERA, or SKIN properly so called, is a substance of very large extent, made up of several kinds of fibres, closely connected, and running in various directions, being composed of the extremities of numerous vessels and nerves. This texture is what we commonly call *leather*; and it makes as it were, the body of the skin. It is not easily torn; may be elongated in all directions, and will afterwards recover itself; and it is thicker and more compact in some places than in others. The outer surface of this substance is furnished with small eminences, called *papillæ*. They appear through its whole surface like small granulations; and seem to be calculated to receive the impressions of touch, being the most easily observed when the sense of feeling is the most delicate, as in the points of the fingers and palms of the hands; and are supposed by many to be the capiliary filaments of the cutaneous nerves, which terminate by small radiated pencils.

(230.) The PAPILLÆ differ very much in figure and disposition in different parts; and they may be distinguished into several kinds. The papillæ of the palm of the hand, of the sole of the foot, and of the fingers and toes, are higher than on the other parts of the body; but they are likewise smaller, closely united together, and placed as it were end-wise with respect to each other, in particular rows, which represent on the skin all kinds of lines, straight, spiral, &c. These lines are often distinctly visible on the hand. The red part of the lips is made up of papillæ, resembling very fine villi or hairs closely united; and there is another particular kind under the nails; the papillæ being there more pointed, or in a manner conical, and turned obliquely towards the ends of the fingers.

(231.) The CUTANEOUS GLANDS, or glands of the skin, merit particular notice under this section. In different parts of the body, we meet with small glands or follicles of an oval form, and seated chiefly under the skin in the corpus adiposum. They are composed of convoluted vessels; and by discharging through small excretory ducts, a fat and oily matter, they serve to lubricate and moisten the skin. The fluid thus secreted, sometimes acquires a degree of thickness, and approaches to the consistence of suet: and from this circumstance, these glands have derived the name of SEBACEOUS. They are found chiefly on the nose, ears, axillæ, &c. Besides the sebaceous glands, Steno, Malpighi, Verheyen, Winslow, and other anatomists tell us, that the skin abounds with a sort of glands, named MILIARY, from their resemblance to millet seed, which are said to open on the surface of the cuticle, and discharge the sweat and matter of insensible perspiration; yet after all that has been said by authors about them, it is certain there are no glands of this kind that can be traced by dissection.

(232.) The filamentary substance, called the BODY *of the* SKIN, is the almost universal integument of the body, and the basis of all the other cutaneous parts. The skin is able to resist external injuries to a certain degree, and defend the parts over which it extends from the effects of friction, blows, &c. to which the human body is often liable. The papillæ are the organs of feeling, and also contribute to an universal evacuation, called *insensible perspiration*. They likewise serve to transmit from without, inwards, the subtle particles of substances applied to the skin. The first of these three uses depends on the extremities of the nerves; the second, on the arterial structure; and the third, on the existence of absorbent vessels on the surface. The cutaneous glands secrete an oily matter; yet without the epidermis, both the papillæ and glands would nevertheless be disturbed in their functions. The epidermis keeps the nervous filaments of the papillæ in an even and regular situation; and likewise moderates the impressions of external objects. Another use of it is, to regulate the cutaneous evacuations already mentioned.

(233.) MEMBRANA ADIPOSA, the adipose, or fatty membrane, is the innermost integument of the body. It is composed of a congeries of membranous laminæ, joined irregularly to each other

other at different distances, so as to form numerous interstices, that communicate with each other. These interstices have been named CELLULÆ, and the substance they compose the *cellular membrane*. The thickness of the membrana adiposa is not the same all over the body. It adheres very closely to the skin, and runs in between the muscles, whose fibres it surrounds and connects. It is also the bond of union between the various cavities of the body and the membranes which line them.

(234.) The CELLULAR INTERSTICES are so many little bags filled with FAT; and these we find plentifully deposited immediately under the skin, and filling up those interstices between the external muscles, which would otherwise have exhibited disagreeable hollow or void places. In some parts the fat serves for a cushion, as on the buttocks, where the laminæ and cells are very numerous. Other parts have little or no fat; as on the forehead, elbows, &c. The fat is likewise of great use to the muscles, in preserving their flexibility, and in lessening their mutual frictions. It may also be some defence against the cold, which, we find makes more impression on lean than on fat persons. This mass of fat, which makes an universal integument of the body, is different from that which is found in the abdomen, thorax, canal of the spina dorsi, articulations of the bones, and in the bones themselves. With regard to the difference existing between particular masses of fat in different parts, it consists chiefly in the thickness or fineness of the pellicles, in the largeness or smallness of the cells and in the consistence of the contained matter.

SECT. III. *Of the* NAILS *and* HAIR.

(235.) To the nails and hair, we allot a separate section, as they cannot properly be classed among the common or general integuments, only particular parts of the body being covered with them. The NAILS are of a compact texture, hard and transparent like horn. Their origin is still a subject of dispute. Malpighi supposed them to be formed by a continuation of the papillæ of the skin: Ludwig, on the other hand maintained, that they were composed of the extremities of blood-vessels and nerves. Both these opinions are now deservedly rejected. They seem to possess many properties in common with the cuticle; like it they are neither vascular nor sensible, and when the cuticle is separated from the true skin by maceration or other means, the nails come away with it. They appear to be composed of different layers, of unequal size, applied one over the other. Each layer seems to be formed of longitudinal fibres.

(236.) In each nail we may distinguish three parts, viz. the root, the body, or middle, and the extremity. The root is a soft, thin, and white substance, terminating in the form of a crescent; the epidermis adheres very strongly to this part; the body of the nail is broader redder, and thicker, and the extremity is of still greater firmness. The nails increase from their roots, and not from their upper extremity. Their principal use is to cover and defend the ends of the fingers and toes from external injury, and to enable us more nicely to handle small objects, as well as to increase our power of grasping large bodies.

(237.) The HAIRS, which from their being generally known, do not seem to require any definition, arise from distinct capsules or bulbs seated in the cellular membrane under the skin. Some of these bulbs include several hairs. They may be observed at the roots of the hairs, which form the beard or whiskers of a cat. The hairs, like the nails grow only from below, by a regular propulsion from their root, where they receive their nourishment. Their bulbs, when viewed with a microscope, are found to be of various shapes. In the head of the scrotum they are roundish; in the eye brows they are oval; in the other parts of the body they are nearly of a cylindrical shape. Each bulb seems to consist of two membranes, between which there is a certain quantity of moisture. Within the bulb the hair separates into 3 or 4 fibrillæ; the bodies of the hairs, which are the parts without the skin, vary in softness and colour according to the difference of climate, age, or temperament of body.

(238.) The hairs likewise differ from each other, and may not be improperly divided into two classes; one of which may include the hair of the head, chin, pubes, and axillæ; and the other, the softer hairs, which are to be observed almost every where on the surface of the body in most people. The skin of many people, however, excepting on the places above-mentioned, is totally free of hair; and some individuals have not a single hair on their whole body—not even upon the head or eye-brows, who, notwithstanding, enjoy perfect health. We know of one such singular instance of a lady of considerable rank in life. The general use of hairs on the body does not seem to be absolutely determined. On the head, they doubtless serve for defence from injury, as well as to preserve and increase the heat. Hairs on the eye brows and eye lids, are destined for particular uses, which will be mentioned when those parts are described. See PART VIII.

SECT. IV. *Of* INSENSIBLE PERSPIRATION *and* SWEAT.

(239.) ONE of the most important offices of the skin is, to exhale moisture from the body and to absorb vapours from the atmosphere. The skin is replete with small arteries, either coiled up into papillæ, or passing directly through it, which afford a passage to the INSENSIBLE PERSPIRATION; and lest it should be collected, as is the case in some diseases, between the skin and the cuticle, there are pores in the cuticle corresponding with the exhaling vessels of the skin, through which it freely passes. In a living person, this exhalation is many ways demonstrable. A clean looking glass placed against the warm and naked skin, is quickly obscured by the moist vapour. In subterraneous caverns, where the air is more dense, it is evidently seen to fly off from the whole surface of the body, like a thick cloud.

(240.) When the motion of the blood is increased by heat or exercise, the small cutaneous pores, instead of an invisible vapour, discharge SWEAT, consisting of minute but visible drops. The parts most subject to sweat are the head, breasts, arm-pits, and foldings of the skin. There

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are many reaſons for ſuppoſing, that the perſpirable matter and ſweat are diſcharged through the ſame kind of veſſels, and that they differ only in the quantity of the matter, and the quickneſs of the evaporation. The nature and quality of the perſpired matter may be inveſtigated by experiments, and by conſidering its analogy to the pulmonary exhalation. What flies off from the lungs in this exhalation is chiefly water; and that the perſpirable matter is alſo chiefly water, is demonſtrated by its obſcuring a glaſs, and by ſeveral other teſts. The water of theſe vapours proceeds chiefly from what we drink, but it is alſo in part ſupplied from what is inhaled by the ſkin. The particular ſmell of the aliments taken into the ſtomach, may be ſometimes plainly perceived in the fluids we perſpire.

(241.) The QUANTITY of our perſpired moiſture is very great, whether we conſider the extent of the organ by which it is ſeparated, the abundance of vapours derived from the lungs only; or barely take a view of the experiments made by Sanctorius. This indefatigable phyſician calculated, that 5 pounds out of 8 of the aliment is diſcharged in a healthy perſon, by inſenſible perſpiration alone, independent of viſible ſweat, and other excretions. In cold climates, the quantity perſpired was found to be four and two ſevenths out of eight. But the cutaneous exhalation is even much greater than this; as not only a quantity of the aliment is thrown off, but likewiſe what is added to the blood by inhalation, which entering, often in a very conſiderable quantity, is thus again expelled. But different diſpoſitions of the air, and of the human body, cauſe great variations in theſe proportions. The difference of time after feeding alſo in ſome meaſure varies the quantity perſpired; but in general it is moſt copious, when the greater part of the digeſted nouriſhment is conveyed into the blood. It is naturally diminiſhed in ſleep, even in warm climates; but it is increaſed by the heat of bed-clothes.

(242.) The uſes of perſpiration are, to free the blood from its redundant water, and to throw out thoſe particles, which, by repeated circulation, have become excrementitious. Perſpiration likewiſe qualifies and ſoftens the cuticle, which is a neceſſary medium extended before the tender ſenſible papillæ of the ſkin. Haller contended, that beſides the exhalent veſſels before-mentioned, the ſkin is full of ſmall veſſels, which inhale or abſorb thin vapours from the air. Theſe he conceived to have been demonſtrated by anatomical injections, which, if thin or watery, ſweated through them as through the arteries. But according to later phyſiologiſts, abſorption is performed ſolely by the ſympathetic veſſels. That abſorption, however, does take place, is ſufficiently proved by the operation of medicines pervading the air, or applied to the ſkin: but ſtill more by the phenomena of ſome diſeaſes, where a much greater quantity of urine has been diſcharged than the quantity of drink taken in.

(243.) Theſe cutaneous veſſels, both exhaling and inhaling, are capable of contraction and relaxation by the power of the nerves. This appears from the effect of the paſſions of the mind; which, if joyful, increaſe the circulation, and relax the exhaling veſſels, ſo as to yield eaſier to the impulſe of the blood; from whence, with a ſhortening of the nerves, there follows a redneſs, moiſture, and turgeſcence of the ſkin. Theſe paſſions, on the contrary, which are ſorrowful, and retard the circulation, contract the exhaling veſſels; as appears from the dryneſs and corrugation of the ſkin, after frights; and from a diarrhœa being cauſed by terror. The ſame affections ſeem to open and increaſe the power of the inhaling veſſels, as variolous or peſtilential contagion is more liable to be contracted by perſons under the influence of fear.

(244.) A moderate and uniform perſpiration is uſually reckoned a ſign of health, becauſe it denotes a free pervious diſpoſition of the veſſels, and a complete digeſtion of the aliment. When it is diminiſhed, it indicates either a conſtriction of the ſkin, a weakneſs of the heart, or an imperfect digeſtion. Moderate exerciſe increaſes perſpiration conſiderably; as do alſo warm, watery, and vinous drinks, animal food of eaſy digeſtion, a moderate warm atmoſphere; and, a cheerful tranquil ſtate of mind. But though the contrary of theſe either leſſen or ſuppreſs perſpiration, we do not find that the continuance of life depends on a ſcrupulous exactneſs in the quantity diſcharged, which is ſo eaſily increaſed or diminiſhed by ſlight cauſes. When greatly or totally ſuppreſſed, however, it tends to produce diſeaſes of that nature, which depends on the putreſcent quality of the particles retained along with it.

SECT. V. *Of the* MEMBRANES *in* GENERAL.

(245.) EACH diſtinct part of the body is covered, and every cavity is lined with a ſingle membrane, whoſe thickneſs and ſtrength is as the bulk of the part it belongs to, and as the friction to which it is naturally expoſed. Thoſe membranes, that contain diſtinct parts, keep the parts they contain together, and render their ſurfaces ſmooth, and leſs ſubject to be lacerated by the actions of the body; and thoſe which line cavities ſerve to render the cavities ſmooth, and fit for the parts they contain to move againſt.

(246.) The membranes of all the cavities that contain ſolid parts, are either beſet with glands, or provided with veſſels, which ſecrete a fluid or mucus, calculated to make the contained parts move freely againſt each other, and prevent their growing together; and thoſe cavities which are expoſed to the air, as the noſe, ears, mouth, and trachea, have in their membranes numerous little glands which ſeparate a mucus thick enough to defend them from the action of the air in reſpiration. Thoſe membranes that have diſtinguiſhing names, and deſerve a particular deſcription, will be treated of as occaſion may require.

SECT. VI. ADENOLOGY: *Of the* GLANDS *in* GENERAL.

(247.) A GLAND is a ſmall round or oval body, chiefly compoſed of a convolution of one or more arteries of a conſiderable length, from whoſe ſides ariſe a vaſt number of excretory ducts. But tho' the larger ſecretions are made by viſible glands, yet unconvolved arteries may alſo have excretory ducts for the ſame purpoſe. In this way probably,

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ſecretions are made from all the membranes that line cavities, as well as in ſome other inſtances. There alſo ariſe from the arteries, which enter into the compoſition of a gland, lymphatic veſſels, whoſe uſe ſeems to be that of taking off the thinner parts of the blood, in thoſe caſes where a thick fluid is to be ſecreted. For lymphatics are to be found in greateſt plenty, in ſuch glands as ſeparate the thickeſt fluids; as in the teſticles and liver; and it is obſervable, that where the thickeſt ſecretions are made, the velocity of the blood is the leaſt, as if nature intended to give thoſe ſeemingly more tenacious parts more time to be ſeparated from the blood.

(248.) The arteries that compoſe different glands are convolved in different manners; but whether their different ſecretions depend upon that, is difficult to determine. The excretory ducts ariſe from the arteries, and unite in their progreſs, as the roots of trees do from the earth; whilſt the ducts, opening into different glands, ſeparate from the ſame maſs of blood their different juices. What theſe different ſecretions however depend upon, whether the peculiar œconomy of the parts, or the different attractions, of which they are rendered capable, we cannot ſay; although this ſubject has employed the attention of ſeveral ingenious anatomiſts.

(249.) The USE of the glands, however, evidently is, to ſeparate particular humours from the maſs of blood. They are uſually divided into two claſſes; but it ſeems more proper to diſtinguiſh three kinds of glands, viz. the mucous, conglobate, and conglomerate.

(250.) I. The MUCOUS GLANDS, or follicles as they are moſt commonly called, are ſmall cylindrical tubes continued from the end of the arteries. In ſome parts of the body, as in the tonſils, for example, ſeveral of theſe follicles may be ſeen folded together in one common covering, and opening into one common ſinus. Theſe follicles are the veſſels that ſecrete and pour out mucus in the mouth, œſophagus, ſtomach, inteſtines, and other parts of the body.

(251.) II. The CONGLOBATE GLANDS are peculiar to the lymphatic ſyſtem. Every lymphatic vein paſſes through a gland of this kind in its way to the thoracic duct. They are met with in different parts of the body, particularly in the axilla, groin, and menſentery, and are either ſolitary or in diſtinct cluſters. See PART VI.

(252.) III. The CONGLOMERATE GLANDS are of much greater bulk than the conglobate, and ſeem to be an aſſemblage of many ſmaller glands. Of this kind are the liver, kidneys, &c. Some of them, as the pancreas, parotids, &c. have a granulated appearance. All theſe conglomerate glands are plentifully ſupplied with blood-veſſels; but their nerves are in general very minute, and few in number. Each little granulated portion furniſhes a ſmall tube, which unites with other ſimilar ducts, to form the common excretory duct of the gland.

SECT. VII. *Of the* SALIVAL GLANDS, THYMUS, *&c.*

(253.) THE SALIVAL GLANDS may be thus enumerated: Glandulæ parotides, maxillares, ſublinguales, molares, buccales, labiales, linguales, amygdalæ, glandulæ palatinæ, uvulares, arytenoidæ, and glandulæ thyroideæ. Of theſe we ſhall only take notice of the moſt conſiderable.

(254.) I. The PAROTID GLANDS are two large, whitiſh glands, irregularly oblong and protuberant, ſituated on each ſide, between the external ear and the poſterior or aſcending ramus of the lower jaw, and lying on ſome part of the neighbouring maſſeter muſcle. The ſuperior portion of this gland lies before the cartilaginous meatus of the ear, and touches the apophyſis zygomatica of the os temporis; extending forward and backward under the lobe of the ear, as far as the maſtoid apophyſis. From the anterior and ſuperior portion of this gland, a duct runs obliquely forward on the outſide of the maſſeter; and then perforates the buccinator, oppoſite to the interſtice between the ſecond and third dentes molares. The external carotid artery and vein, and the portio dura of the ſeventh pair of nerves, paſs through the ſubſtance of the parotid glands, to which they give branches.

(255.) II. The MAXILLARY GLANDS are ſmaller and rounder than the parotids; and are ſituated each on the inſide of the angle of the lower jaw, near the muſculus pterygoidæus inferior.—From the inſide, or that which is turned to the muſculus hyo-gloſſus, each of them ſends out a duct in the ſame manner as the parotids; but it is ſmaller and longer, and goes by the name of *ductus ſalivalis Whartoni*, or *ductus inferior*.

(256.) III. The GLANDULÆ SUBLINGUALES are likewiſe two in number, of the ſame kind with the former, only ſmaller, ſomething oblong, and flatted like a blanched almond. They are ſituated, as their name implies, under the anterior portion of the tongue, one on each ſide, and ſend out laterally ſeveral ſhort ducts which open near the gums, at a ſmall diſtance from the frænum, and a little more backward.

(257.) IV. The GLANDULÆ MOLARES are two glands nearly of the ſame kind with the former, each being ſituated between the maſſeter and buccinator. Their ſmall ducts perforate the latter muſcle, and open into the mouth, near the laſt dentes molares: from which circumſtance they take their name.

(258.) V. The GLANDULÆ LINGUALES are thoſe of the foramen cæcum of the baſis of the tongue.

(259.) VI. The UVULAR GLANDS are only a continuation of the membrane of the palate, in the form of a ſmall bunch of grapes. We might likewiſe reckon among the ſalival glands thoſe of the ſuperior portion of the pharynx, and alſo the follicles of the membrana pituitaria of the nares, and of the ſinuſes which communicate with them.

(260.) VII. The AMYGDALÆ are two glandular bodies of a reddiſh colour, lying in the interſtices between the two lateral half arches of the ſeptum palati, one on the right, the other on the left ſide of the baſis of the tongue. They ſomewhat reſemble an almond ſhell, in having an uneven ſurface, and in being full of little holes, through which their ſecretions are evacuated, whence they have obtained the Engliſh name of *Almonds*.

(261.) VIII. The GLANDULA THYROIDÆA is a large

large reddiſh maſs, covering the anterior convex ſide of the larynx. It ſeems to be made up of two oblong glandular portions united by their inferior extremities, below the cricoid cartilage, in ſuch a manner as to have ſome reſemblance to a creſcent, with the cornua turned upward. The two lateral portions lie on the muſculi thyroidæi, and the middle or inferior portion on the crico-thyroidæi. This gland ſeems to be of the ſame kind with the other ſalival glands, but is more ſolid. It is formed of glandulous grains, and of veſicles of different ſizes, full of a yellowiſh oily liquor, which may ſerve to lubricate the parts in its neighbourhood.

(262.) Secretion being very much promoted by preſſure upon the ſurface of a gland, the ſalival glands are ſo ſeated as to be preſſed by the lower jaw, and its muſcles, which chiefly happens at thoſe times when the fluid is wanted. The force too with which the jaw muſt be moved, being in proportion to the dryneſs and hardneſs of the food maſticated, the ſecretion from the glands depends very much upon the exertion of that force. All food requires to be reduced to a pulp, and mixed with ſaliva before it can be fitted for digeſtion; therefore the drier and harder foods, needing more of this ſecretion, will, from the mechaniſm, be ſupplied with more of it than moiſter foods, in that proportion in which they are drier and harder. What quantity of ſaliva theſe glands can ſeparate from the blood, in a given time, is not eaſy to determine, but we all know from experience how freely they act when neceſſity requires.

(263.) The THYMUS is a conglobate gland, the uſe of which is not perfectly aſcertained, its excretory duct not having yet been diſcovered. It is of an oblong figure, and is larger in the fœtus and in young children than in adults, being ſometimes nearly effaced in very old ſubjects. It is placed in the upper part of the thorax, between the two laminæ of the mediaſtinum; but at firſt is not altogether contained within the cavity of the cheſt, being found to border upon the upper extremity of the ſternum.

PART IV. SPLANCHNOLOGY.

SECT. I. *Of the* ABDOMEN, *and its* GENERAL CONTENTS.

(264.) ALTHOUGH SPLANCHNOLOGY, in the ſtrict meaning of the word, reſpects only the bowels or contents of the abdomen, yet it would be improper to deſcribe the particular viſcera, without firſt taking notice of the great cavity which contains them.

(265.) The ABDOMEN, or LOWER BELLY, as it is commonly ſtiled by anatomiſts, (although none of them ever ſpeak of an *upper* one) extends from the lower extremity of the ſternum, or the hollow, uſually called *ſcrobiculus cordis* or the *pit* of the ſtomach, to the lower part of the trunk. It conſiſts of three diviſions, called *regions*; viz. the *epigaſtric*, the *umbilical*, and the *hypogaſtric*.

(266.) The EPIGASTRIC REGION, begins immediately under the ſternum, and extends to within two finger breadth of the navel; where the middle or *umbilical region* begins, and reaches to the ſame diſtance below the navel. The *hypogaſtric*, includes the reſt of the abdomen, as far as the os pubis. Each of theſe regions is ſubdivided into three others; two of which compoſe the ſides, and the other the middle part of each region.

(267.) The middle part of the upper region is called *epigaſtrium*, and its two ſides *hypochondria*. The middle part of the next region, the *umbilical region*, properly ſo called, and its two ſides, are the flanks, or *iliac* regions. Laſtly, the middle part of the lower region retains the name of *hypogaſtrium*, and its ſides are called *inguina* or groins.—The back part of the abdomen bears the name of *lumbar region*. Theſe are the diviſions of the lower belly, which ought to be remembered as they frequently occur in ſurgical and anatomical writings. We will now proceed to the contents of the abdomen; and after mentioning the ſeveral viſcera contained in it, with their relative ſituations, deſcribe each of them ſeparately.

(268.) When the ſkin, adipoſe membrane, and abdominal muſcles are removed, we diſcover the peritonæum or membrane that envelopes all the viſcera of the lower belly. Upon opening the peritonæum, the firſt part that preſents is the omentum or cawl, floating on the ſurface of the inteſtines, which are likewiſe ſeen every where looſe and moiſt, and making a great number of circumvolutions through the whole cavity of the abdomen. The ſtomach is placed in the epigaſtrium, and under the ſtomach is the pancreas.—The liver fills the right hypochondrium, and the ſpleen is ſituated in the left. The kidneys are ſituated about the middle of the lumbar region, and the urinary bladder and parts of generation are ſeated in the lower diviſion of the abdomen.

SECT. II. *Of the* PERITONÆUM *and* OMENTUM.

(269.) I. THE PERITONÆUM is a ſtrong membrane which lines the whole cavity of the abdomen, and envelopes and partly ſupports the liver, ſpleen, omentum, ſtomach, inteſtines, and meſentery, with all their veſſels and glands. The ſuperior portion of it extends over that part of the diaphragm, which conſtitutes a part of the cavity of the abdomen. It may be conſidered as a ſingle membrane, though deſcribed by many anatomiſts as a duplicature of two diſtinct membranous laminæ. Its inner ſubſtance is very ſmooth, and poliſhed on that ſide which is next the viſcera, and it is continually moiſtened by a ſerous fluid, diſcharged through almoſt imperceptible pores, opening chiefly from the exhalent veſſels. The cellular ſubſtance, or external portion of the peritonæum, adheres very cloſely to the parts which form the inſides of the cavity of the abdomen; but it is not every where of an equal thickneſs.—Theſe great blood veſſels, the aorta and vena cava, are involved in this cellular ſubſtance of the peritonæum. Indeed, it involves immediately and ſeparately, all the parts and organs, which are commonly ſaid to lie in the duplicature of the peritonæum.

(270.) The principal uſes of the peritonæum are very evident. It ſerves to line the cavity of the abdomen, to inveſt the viſcera contained in that cavity as in a common bag, to ſupply them with particular coats, and to form pro-

duction

ductions, ligaments, connections, folds, &c. as we ſhall ſee hereafter. The fine fluid, which tranſudes through the whole internal ſurface of the peritonæum, prevents the inconveniencies which might ariſe from the continual frictions and motions to which the viſcera of the abdomen are expoſed, either naturally or by accident.

(171.) When this fluid is ſupplied in too great a quantity, or the abſorbents become incapable of carrying it off, it accumulates, and conſtitutes an aſcites or dropſy of the belly; and when by any means the exhalation is diſcontinued, the peritonæum thickens, becomes diſeaſed, and the viſcera are ſometimes found adhering to each other. The peritonæum is not very vaſcular. In a found ſtate it ſeems to be endued with little or no feeling, and the nerves that paſs through it appear to belong to the abdominal muſcles.

(172.) II. The OMENTUM, EPILOON, or cawl, is a fine membrane, interlarded with fat, in a kind of net work. It is formed by a duplicature of the peritonæum, and falls looſely over the ſurface of the ſmall inteſtines, reſembling an apron tucked up. Its outer or ſuperior portion, termed *ala ſuperior*, is connected to the bottom of the ſtomach, the ſpleen, and part of the duodenum; and thence deſcending a little lower than the navel, is reflected and tied to the colon, the ſpleen, and part of the duodenum. This laſt part is called *ala inferior*; and the ſpace between the alæ is named *burſa*. This cavity is very diſtinct in moſt brutes, but ſeldom ſo in men. Sometimes both alæ are tied to the liver, and, in diſeaſed bodies, where there has exiſted inflammation, to the peritonæum. Its uſe is to lubricate the inteſtines, in order that they may the eaſier perform their periſtaltic motions. Malpighi deſcribes adipoſe ducts in this membrane to carry the fat from the cells into the vena portæ, and thinks it a neceſſary ingredient in the bile.

(173.) This part was the only one known to the ancients under the name of *epiploon*; but at preſent we diſtinguiſh three omenta, viz. *magnum colico-gaſtricum*, *parvum hepatico-gaſtricum*, and *coli*cum. They are all formed of two very delicate laminæ, ſeparated by a thin layer of cellular membrane. Theſe laſt are ſtiled by ſome anatomiſts, *appendices epiploicæ*.

(174.) The omentum magnum colico-gaſtricum derives its arteries from the ſplenic and hepatic. Its veins terminate in the vena portæ. Its nerves, which are very few, come from the ſplenic and hepatic plexus.

(175.) The omentum parvum hepatico-gaſtricum, abounds leſs with fat than the great epiploon. It begins at the upper part of the duodenum, extends along the leſſer curvature of the ſtomach as far as the œſophagus, and terminates about the neck of the gall bladder, and behind the left ligament of the liver, ſo that it covers the leſſer lobe; near the beginning of which we may obſerve a ſmall opening, firſt deſcribed by Winſlow, through which the whole pouch may eaſily be diſtended with air. The veſſels of the omentum parvum are derived chiefly from the coronary ſtomachic arteries and veins.

(176.) The omentum colicum begins at the fore part of the cæcum and right ſide of the colon. It appears as a hollow conical appendage to theſe inteſtines, and uſually terminates at the back of the mentum magnum. It ſeems to be nothing more than a membraneous coat of the cæcum and colon, aſſuming a conical ſhape when diſtended with air.

Sect. III. *Of the* Alimentary Canal, Stomach, Digestion, *and* Intestines.

(177.) DUCTUS ALIMENTALIS, the alimentary duct or canal, conſiſts of the œſophagus, and ſtomach, together with the large and ſmall inteſtines; which though they are in fact only one long and extenſive canal, are diſtinguiſhed by different names; viz. the duodenum, jejunum, ilium, colon, cæcum, or appendicula vermiformis, (as ſome call it,) and rectum.

(178.) I. The OESOPHAGUS, or Gullet, is a canal partly muſcular and partly membranous; which commences at the inferior part of the mouth, to which it is joined by the pharynx, and deſcends along the neck and back part of the thorax, into the abdomen, where it joins to the ſtomach. It is made up of four coats: The 1ſt is formed only by a duplicature of the poſterior part of the mediaſtinum, and is wanting above the thorax and in the neck. The 2d coat is made up of ſeveral ſtrata of fleſhy fibres, moſtly longitudinal, and their quantity is conſiderably greater. The 2d is termed the *nervous coat*, and is like that of the ſtomach and inteſtines. It is diſtributed in folds or plaits according to its length, and is ſurrounded by a whitiſh cotton-like ſubſtance, which, when ſteeped in water, ſwells and grows thicker. The 4th or innermoſt coat reſembles, in ſome meaſure, that of the inteſtines; except that, inſtead of the villi, it has ſmall and very ſhort papillæ. It is folded lengthwiſe like the 3d coat; ſo that the œſophagus, when cut acroſs, repreſents one tube within another. Through the pores of this coat, a viſcid lymph is continually diſcharged, to facilitate the paſſage of food into the ſtomach.

(179.) II. VENTRICULUS, the *Stomach*, is a great bag or reſervoir, ſituated partly in the left hypochondrium, and partly in the epigaſtrium. Its figure is like that of the bag of a bag-pipe; oblong, incurvated, large and capacious at one end, and ſmall and contracted at the other. We ſee in this kind of figure two arches or curvatures, one large, which runs along the greateſt convexity; and one ſmall, directly oppoſite to the former. The ſtomach has two openings, called its *orifices*; one between the great extremity and the ſmall curvature; the other at the end of the ſmall or contracted extremity. The firſt opening, named *cordia*, is a continuation of the œſophagus; the other joins the inteſtinal canal, and is called *pylorus*. The aliment paſſes down the œſophagus, into the ſtomach, through the cardia, and, after being digeſted paſſes through the pylorus, where the inteſtinal canal begins.

(180.) The great extremity of the ſtomach is in the left hypochondrium, and cloſe under the diaphragm. Yet the ſuperior orifice is not in the left hypochondrium, but almoſt oppoſite to, and very near the middle of, the bodies of the loweſt vertebræ of the back. Its ſmall extremity does not reach to the right hypochondrium, but bends

obliquely backwards toward the upper orifice; ſo that the pylorus lies about two fingers breadth from the body of the vertebræ immediately under the ſmall portion of the liver.

(281.) The ſtomach is compoſed of 4 tunics or coats, ſo intimately connected together that it requires no little dexterity in the anatomiſt to demonſtrate them. The exterior one is membranous, being derived from the peritonæum.—The 2d is a muſcular tunic, compoſed of fleſhy fibres which are in the greateſt number about the two orifices. The 3d is called the nervous coat, and within this is the villous or velvet-like coat, which compoſes the inſide of the ſtomach. The two laſt coats being more extenſive than the two firſt, form the folds, which are obſerved every where in the cavity of this viſcus, and more particularly about the pylorus; where they ſeem to impede the too haſty exclusion of the aliment, making a conſiderable plait, called *valvula pylori*. The inner coat is conſtantly moiſtened by a mucus which approaches to the nature of the ſaliva, and is called the gaſtric juice; this liquor has been ſuppoſed to be ſecreted by certain minute glands ſeated in the nervous tunic, whoſe exterior ducts open the ſurface of the villous coat.

(282.) Here it is proper to take notice of that important operation of the ſtomach, called Digestion. By this term is underſtood, the changes our aliment undergoes for the formation of chyle. The manner in which this is performed has been matter of great controverſy. The different doctrines of fermentation, attrition, and ſolution by heat, as in the machine called Papin's Digeſter, have given way to more rational opinions. The experiments of the Abbe Spallanzani and Mr Hunter uniformly prove that digeſtion is not affected by any fermenting power, by contractions of the ſtomach, or by heat; but by a peculiar fluid ſecreted in the coats of the ſtomach, called the gastric juice. This is poured into the cavity, and there animalizes the food, or aſſimilates it to the nature of blood. It has alſo appeared that animals, or parts of animals, poſſeſſed of the living principle, when taken into the ſtomach, are not in the leaſt affected by the action of that viſcus; but the moment they loſe the living principle they become ſubject to its digeſtive powers. This ſeems to be the caſe with the ſtomach, which is enabled to reſiſt the action of its juices in the living body; but when deprived of the living principle, it is then no longer able to reſiſt the powers of that menſtruum, which it had itſelf formed for the digeſtion of its contents; the proceſs of digeſtion appearing to be continued after death; ſo that the inner coat of the ſtomach itſelf is eroded.

(283.) After having been ſufficiently divided by maſtication, and mixed with ſaliva in the mouth, the food enters into the ſtomach, where it is thoroughly blended with the gaſtric juice. Here it is capable alſo of irritating the inner coat of the ſtomach to a certain degree, and occaſioning a contraction of its two orifices. In this membranous bag, ſurrounded by the abdominal viſcera, and with a certain degree of natural heat, the contents of the ſtomach undergo a conſtant agitation by means of the abdominal muſcles and of the diaphragm, and likewiſe by a certain contraction or expanſion of the muſcular fibres of the ſtomach itſelf. By this motion, every part of the food is expoſed to the action of the gaſtric juice, which gradually divides and attenuates it, and prepares it for its paſſage into the inteſtines.

(284.) After the food has remained from one to three hours in the ſtomach, it is converted into a greyiſh pulp, called *chymus*, and ſome few milky particles begin to appear. The time of its reſidence in this bag is proportioned to the nature of the aliment, and the ſtate of the ſtomach and its juices. The thinner and more perfectly digeſted parts paſs by a little at a time into the duodenum; while the groſſer and leſs digeſted particles remain in the ſtomach, till they acquire a ſufficient degree of fluidity to paſs into the inteſtines, where the nature of this pulp is perfectly changed. The bile and pancreatic juice which flow into the duodenum, and the mucus, which is every where diſtilled from the ſurface of the inteſtines, mingle with the ejected matter, and ſtill farther attenuate and diſſolve it.

(285.) Two ſubſtances, very different from each other in their nature and deſtination, are the reſult of this combination. One of theſe, which is compoſed of the liquid parts of the aliment, and of ſome of its more ſolid particles, extremely divided and mixed with the juices we have deſcribed, conſtitutes a very mild, ſweet, and whitiſh fluid, reſembling milk, and diſtinguiſhed by the name of *chyle*. This fluid is abſorbed by the lacteal veſſels, which convey it into the circulation, where, by being aſſimilated into the nature of blood, it affords that ſupply of nutrition, which the continual waſte of the body requires. The other is the remains of the alimentary maſs, deprived of all its nutritious particles, and containing only ſuch parts as were rejected by the abſorbing mouths of the lacteals. This groſſer part, called the *feces*, paſſes on through the courſe of the inteſtines, and is voided at the anus.

(286.) The Intestinal Canal is 5 or 6 times as long as the body, and forms many circumvolutions in the cavity of the abdomen, which it traverſes from the right to the left, and again from the left to the right; in one place deſcending, and in another extending itſelf upwards. The inner coats of the inteſtines, being more capacious than their exterior tunics, form a multitude of plaits, placed at certain diſtances, and called *valvulæ conniventes*. Now this diſpoſition will be found to afford a farther proof of that divine wiſdom, which the anatomiſt and phyſiologiſt may diſcover in all their purſuits.—For if the inteſtinal canal was much ſhorter than it naturally is, if it paſſed in a direct courſe from the ſtomach, and if its inner ſurface was deſtitute of valves; the aliment would paſs with great rapidity to the anus, and ſufficient time would be wanting to aſſimilate the chyle, and abſorb it into the lacteals; ſo that the body would be deprived of the ſupply of nutrition, which is ſo eſſential to life and health.

(287.) The inteſtinal canal is divided into ſmall and large inteſtines; the former being diſtinguiſhed by the names of duodenum, jejunum, and ileum;

ileum; and the latter by those of cæcum, colon, and rectum. The former fill the middle and fore parts of the belly; the latter the sides, and the upper and lower parts.

(288.) III. The DUODENUM is so named, because it is about 12 inches long. It begins from the pylorus at the extremity of the stomach; and is thence reflected downwards. It first passes by the gall-bladder, then under the following gut and mesentery, and coming once more in sight at the left hypocondrium, it there commences jejunum, which is the second of the small intestines; but the place where this ends and the other begins is not precisely determined.

(289.) IV. The JEJUNUM is so called from its being found for the most part empty. It is situated in the regio, umbellicus, and makes somewhat more than a third part of the small intestines. It is distinguished from the next succeeding intestine by its coats, which are somewhat thinner and less pale.

(290.) V. The ILIUM is a continuation of the former gut. It is situated in the hypogastrium, and very often some part of it passes into the pelvis, and lies upon the urinary bladder, especially in women. It enters the colon on the right side, near the upper edge of the os ilium. This great length of the small intestines is evidently for the convenience of a greater number of lacteals, that the chyle which misses their orifices in one place may not escape them in another. Those animals which swallow their food whole, and retain it for a long time, have the alimentary canal furnished with shorter and fewer lacteals.

(291.) VI. The large circumvolution of the ileum covers the first of the large intestines, called the CÆCUM, which seems properly to belong to the colon, being a kind of punch of about 4 inches wide, and nearly of the same length; having exteriorly a little appendix called *appendix vermi*, or the *vermiform* appendix, from its resemblance to a worm. Some anatomists restrict the name of cæcum to this little gut, which is preposterous, as the cæcum is ranked among the great intestines, and this *appendicula* is the smallest of them all. The arrangement here stated is therefore now generally adopted. The cæcum is placed in the cavity of the os ilium on the right side, and terminates in the *colon*, which is the largest of all the intestines.

(292.) VII. The COLON ascends by the right kidney, to which it is attached; passes under the hollow part of the liver, and the bottom of the stomach, from the right hypochondrium to the left, and thence descends into the pelvis at the place where the appendix cæci joins it. One portion of the circumference of both is depressed, and forms a large fold on the inside, which advances into the cavity of the intestine, and gets the name of *valve* of the *colon*. Thence the colon passes down towards the os sacrum, where the canal takes the name of *rectum*. The colon, in its course, is also attached to the spleen and the left kidney.

(293.) VIII. The RECTUM, or *straight gut*, is the last of all the intestines. It is so named, because when viewed directly forward, it appears to run down in a straight course from the last vertebra of the loins, on the fore side of the os sacrum, all the way to the os coccygis, where it ends in the *anus*. This intestine, properly speaking, is a true continuation of the last convolution of the colon; and it is the repository and common sewer of the whole intestinal canal. The figure of the rectum varies according as it is full or empty. When empty it is irregularly cylindrical, and sinks in by a kind of transverse folds; and in that state it is about three fingers breadth in diameter. When full, it is wider in proportion, and may be distended to a considerable size.

(294.) IX. The extremity of the intestine which forms the ANUS, has several muscles belonging to it, some surrounding it like sphincters; the rest broad fleshy planes inserted in it, and which, being likewise fixed to other parts, sustain it in its natural situation, and restore it to that situation, after being disturbed by the force necessary for the exclusion of the fæces.

(295.) All the intestines have the same coats with the stomach; the fibres of their middle or muscular coats are circular, or spiral, and longitudinal; of the latter indeed but very few. The antagonists to these muscular fibres, of the stomach and guts, are formed by their contents, which are pressed from one place to another, and the muscles of the abdomen; for these also pressing upon them alter their form into one less capacious, which necessarily extends their circular fibres. The large intestines have three membranes or ligaments on the outside, running their whole length, and supporting the sacculi, into which those intestines are divided. The lesser intestines have, at very small distances, semilunar valves placed opposite to the interstices of each other, to prevent the aliment from passing too speedily through them; and the better to answer that end, they are larger and more numerous near the stomach, where the food is thinner, than they are towards the colon, where the food is continually made thicker in its progress, by a discharge of part of the chyle. This contrivance, so necessary to men, because of their erect posture, becomes a great inconvenience, when they are obliged by sickness or accidents, to lie in an horizontal posture, and calls for the help of clysters and purges. But brutes have not these valves, because they are not convenient in an horizontal posture.

(296.) At the entrance of the ilium into the colon are two very large valves, which effectually hinder the regress of the fæces into the ilium. But clysters have been frequently known to pass them, and be vomited up; though it is doubtful whether the excrement that is sometimes vomited up, is such as had passed into the large intestines. The *valvulæ conniventes* in the colon are placed opposite, yet not in the same plane, to each other, and make, with their anterior edges, an equilateral triangle; but as the gut approaches the anus, they become less remarkable, and fewer in number. All the intestines have in their inner membrane an almost infinite number of very small glands. These glands will, especially some of them in the larger guts, appear to the naked eye when they are diseased. They have been called *glandulæ pierianæ*.

SECT. IV. *Of the* MESENTERY, LIVER, GALL-BLADDER, PANCREAS, *and* SPLEEN.

(297.) I. THE great bundle of inteſtines, deſcribed in laſt ſection, is not left to move at random in the cavity of the abdomen; but is carefully bound down by a membraneous web, which prevents the inteſtinal convolutions from being intangled in each other, and yet allows them a gentle, floating, but limited motion.—This web, which is called the MESENTERY, is diſtingniſhed into two portions; one very broad and much plaited, which connects the ſmall inteſtines; the other long and incurvated, which does the ſame to the large ones. But in fact theſe two portions conſiſt only of the membraneous laminæ of the peritoneum doubled back upon itſelf, after having incloſed the inteſtines, and are diſtinguiſhed only by their breadth. Taken both together, they form a kind of ſpiral roll, more or leſs plaited in its circumference. The firſt portion, which accompanies the ſmall inteſtines, has retained the name of *meſentery*; thoſe parts of it, which are attached to the colon and rectum, are called *meſocolon* and *meſorectum*. Between theſe laminæ there are numerous blood veſſels, many nervous filaments, and an infinite number of ſmall veſſels called *lymphatics*, of which afterwards,

(298.) The meſentery is attached to the lumbar vertebræ, which ſerves to keep the inteſtines in their natural ſituation. The idea uſually formed of the colic, called *miſerere*, is perfectly erroneous; it being impoſſible that the inteſtines can be *twiſted*, as many ſuppoſe that they are, in that diſeaſe, their attachment to the meſentery effectually preventing ſuch an accident—but a diſarrangement ſometimes takes place in the inteſtinal canal itſelf, which is productive of diſagreeable, and ſometimes fatal conſequences.—This is by an introſuſpection of the inteſtine, an idea of which may be eaſily formed, by taking the finger of a glove, and involving one part of it within the other. If inflammation takes place, the ſtricture in this caſe is increaſed, and the periſtaltic motion of the inteſtines, *i. e.* the progreſſive motion of the fæces downwards, is inverted, and what is called the *iliac paſſion* follows. The ſame effects may be occaſioned by the deſcent of the inteſtine, or of the omentum, either with it or by itſelf, and thus conſtituting what is called an *hernia* or *rupture*; a term by which in general is meant the falling down or protruſion of any part of the inteſtine, or omentum, which ought naturally to be contained within the cavity of the belly.

(299.) II. The LIVER is the largeſt gland in the body; and its colour is that of a duſky or brown red. It is ſituated immediately under the diaphragm in the right hypochondrium. Its exterior ſide is convex, and interior concave. Backward towards the ribs it is thick, and thin on its fore part, where it covers the upper ſide of the ſtomach, and ſome of the inteſtines. The upper ſide of it is connected with the diaphragm, being alſo tied to that and the ſternum by a thin ligament, which is deſcribed commonly as two; the upper portion being named *ſuſpenſorium*, and the anterior *latum*; But either of theſe names is ſufficient for the whole. It is alſo tied to the navel by a round ligament called *teres* or *umbilical*, which is merely the umbilical vein of the fœtus condenſed into a ligament, and which is inſerted into the liver at a ſmall fiſſure in its lower edge. The ligamentum latum or ſuſpenſorium, ſuſtains the liver in an erect poſture, or rather fixes it in its ſituation, while it is ſupported by the other viſcera, they being compreſſed by the abdominal muſcles. When we are placed in an horizontal poſture, the teres prevents it from preſſing on the diaphragm; and in lying on the back they both together ſuſpend it, that it may not compreſs and obſtruct the aſcending vena cava. It is ſupplied with blood by the branches of the celiac and meſenteric arteries, called, in this viſcus, *arteriæ hepaticæ*; but its blood veſſels, that compoſe it as a gland, are the branches of the vena porta, which enters the liver, and diſtributes its blood like an artery, to have the bile ſecreted from it; and the branches of the cava in the liver, which return the redundant blood into the cava aſcendens. It has alſo ſeveral branches of nerves, and a great number of lymphatics. Thoſe quadrupeds, that have a great deal of motion in their backs, have their livers divided into many diſtinct lobules; which, by yielding to each other, obey thoſe motions, without any danger of laceration.

(300.) III. The GALL-BLADDER is a receptacle for the bile, ſeated upon the inferior and concave ſurface of the liver. It is ſhaped like a pear and compoſed of one denſe and ſomewhat muſcular coat, which is covered with peritoneum like that of the liver. It is alſo lined with another membrane that cannot eaſily be ſeparated, making three coats in the whole. From the gall-bladder towards the duodenum runs a duct called *cyſticus*; and from the liver to this duct, one called *hepaticus*, which carries off the gall this way, when the gall-bladder is full. The ductus cyſticus and hepaticus being then united and forming one common channel, commences *ductus communis choledochus*, which enters the duodenum obliquely about 4 inches below its commencement. The orifice of this duct in the gut is ſomewhat eminent, elevated above the ſurface, but has no caruncle, as has been deſcribed by ſome. As the liver, from its ſituation in the ſame cavity with the ſtomach, will be moſt preſſed, and conſequently ſeparate moſt gall where the ſtomach is fulleſt, namely, the time when it is moſt wanted; ſo the gall-bladder, lying next the duodenum, will have its fluid preſſed out by the aliment paſſing through that gut, and conſequently at a right time and in due proportion; becauſe the greater that quantity of aliments, the greater will be the compreſſion; and *vice verſa*. A chemical analyſis of the bile, and experiments of its mixture with various ſubſtances, demonſtrate, that it contains a large portion of water, and a conſiderable quantity of inflammable oil, which appears very evidently in gall ſtones. The bile, therefore, is a natural ſoap; but of that ſort which is made from a volatile ſaline lixivium, mixed with oil and water. This, therefore, being intermixed with the aliment, reduced to a pulp, and ſlowly expreſſed from the ſtomach, by the periſtaltic force of the

duodenum

duodenum and preſſure of the abdominal muſcles, incorporates them all together; and the acid or acefcent qualities of the food are in ſome meaſure thus corrected. The curd of milk is alſo diſſolved by it into a liquid, and the whole maſs of aliment inclined more to a putrid alkaleſcent diſpoſition. It diſſolves the oily matters, ſo that they may freely incorporate with the watery parts, and make up an uniform maſs of chyle to enter the lacteals; the ſurrounding mucus in the inteſtines is thereby abſterged and attenuated, and the periſtaltic motion is excited by its acrimony; all which offices are confirmed, by obſerving the contrary effects from a want or defect of this neceſſary fluid. The bile deſcends ſlowly along with the alimentary maſs; and having ſpent its force, moſt of it is afterwards excluded with the feces; but probably ſome of the more ſubtile, watery, and leſs bitter parts, are again taken up by the abſorbents.

(302.) IV. The PANCREAS, or *ſweet-bread*, as it is vulgarly called, is a large conglomerate gland of the ſalivary kind, lying acroſs the upper and back part of the abdomen, near the duodenum. It has a ſhort excretory duct, about half as large as a crow quill, though it is commonly painted as large as the ductus communis choledochus. It always enters the duodenum together with the bile duct, but in dogs at ſome diſtance from it; and, for the moſt part, in two ducts at a diſtance from one another. The fluids of this gland, together with the bile, help to complete the digeſtion of the aliment, and render it fit to be taken up by the lacteal veſſels. Winſlow has alſo obſerved, that, where the great extremity of the pancreas is connected to the curvature of the duodenum, it ſends down an elongation, which adheres very cloſely to the following portion of the inteſtine; and, upon a careful examination, he found a particular pancreatic duct ramified like the large one, which ran towards and interſected this great duct, into the extremity of which it opened after having perforated the duodenum. This portion he termed *pancreas minus*. It ſometimes opens ſeparately into the duodenum, in which we likewiſe obſerve ſeveral ſmall holes round the ductus choledochus, which anſwer to the pancreas.

(304.) V. The LIEN, or *ſpleen*, is ſeated in the left hypochondrium, immediately under the diaphragm, and above the kidney, between the ſtomach and the ribs. It is ſupported by the ſubcontained parts, and fixed to its place by an addition to the peritoneum and diaphragm. It alſo furniſhes a point of attachment to the omentum, as has been already obſerved. The figure of it is a ſort of depreſſed oval, near twice as long as broad, and almoſt twice as broad as thick. Sometimes it is divided into lobules, but for the moſt part has only one or two ſmall fiſſures on its edge, and ſometimes none. In its colour it reſembles caſt iron. The inner texture, in brutes, is veſicular, like the penis, and contains grumous blood, and alſo ſmall bodies like glands; but Ruyſch denies that the human ſpleen is of the ſame texture. The ſpleen has often been removed from dogs without any remarkable inconvenience to them. Mr Cheſelden ſpeaks of having ſeen in the human ſubject, 2, and 3, and in one inſtance 4 ſpleens. Some of theſe, though ſmall, differed from each other in ſize; others were nearly equal in bulk, but the whole together, in any one of theſe ſubjects, would not amount in ſize to more than a ſpleen of ordinary dimenſions. The want of an excretory duct to this viſcus has occaſioned the uſe of it to be doubtful and controverted. Anatomiſts indeed have gone no further than to conjecture, that it may prepare the blood for ſupplying a ſort of watery juice, (probably of a ſubalkaline nature and rendered ſomewhat ſharp by the remora of the blood,) to the bile.

SECT. V. *Of the* KIDNEYS, URETERS, URINARY BLADDER, *and* GLANDULÆ RENALES.

(303.) I. THE KIDNEYS in the human ſubject greatly reſemble thoſe of the hog; and weigh about 12 ounces. They are ſeated towards the upper part of the loins upon the two laſt ribs; the right under the liver, and a little lower than the other, and the left under the ſpleen. Their uſe is to ſecrete the urine from the blood, which is brought thither for that purpoſe by the emulgent arteries; and what remains, after the functions of the gland have been performed, is returned by the emulgent veins, while the urine ſecreted is carried through the ureters into the bladder.

(304.) II. The URETERS are two tubes, each of them about the bigneſs of a gooſe quill, and about a foot long. They ariſe from the indented ſide of the kidneys, and end in the bladder near its neck, running obliquely for the ſpace of an inch between its coats, by which mode of entering, their extremities form a kind of valves. The beginning of the ureters in the kidney are the *tubuli urinarii*, which joining together from the pelvis in each kidney. Between the tubuli urinarii, authors have remarked ſmall papillæ; and the other which are diſtinguiſhed by a clearer colour are called *glandulæ*.

(305.) III. The URINARY BLADDER is ſeated in a duplicature of the peritonæum in the lower part of the pelvis of the abdomen. Its ſhape is orbicular, and its coats are the ſame with thoſe of the inteſtines and other hollow muſcles already deſcribed; viz. the external membraneous, the middle muſcular, which is the *muſculus detruſor urinæ*, and the inner membraneous coat, exceedingly ſenſible, as is well known to thoſe who have the ſtone, or are troubled with the gravel. The uſe of this nice ſenſe is to make it capable of that uneaſineſs, which excites animals to exclude their water, when the bladder is diſtended. This ſenſe indeed is naturally ſo delicate, that no fluid but healthy urine can be long endured; even pale urine, or urine with matter in it, in a degree excites the ſymptoms of the ſtone, and forces the patient to evacuate the bladder. Some writers have ſuppoſed the exiſtence of a ſhort paſſage for fluids into the bladder, from the copious and ſpeedy evacuations of pale urine, which ſucceed the drinking of weak intoxicating liquors, of mineral waters, &c. But the fact is, that there does not ſeem to be any other way for the urine to paſs, than that by the kidneys and along the courſe of the ureters. For the bladder is, on all ſides

ſides, ſeparated from the cavity of the abdomen by the peritonæum; nor is it probable that the vapours, which either go out from the bladder, or which are derived towards it from other parts, can here find open pores through the peritonæum. The bladder may be ſo diſtended with urine as to produce death; yet, in theſe caſes, we never obſerve that the urine has found any paſſage, through which it might eſcape into the pelvis. Again, when the ureters are obſtructed with ſtones, ſo that the bladder receives nothing from them, it is either quite empty, or contains a very acrimonious and thick urine, manifeſtly indicating that the water can find no other way from the kidney into the bladder. A careful attention, indeed, to the manner in which mineral waters are diſcharged by urine, ſufficiently demonſtrates that there is no ſuch rapidity therein as is commonly imagined; but the ſtimulus of the cold water received into the ſtomach, like the external cold applied to the ſkin, cauſes a concuſſion of the bladder and urinary parts, by which they are ſolicited to repeated diſcharges of the old urine, which was before in the body, and not immediately of that which was laſt drunk. Again, the largeneſs of the renal veſſels demonſtrates, that they cannot receive much leſs than an 8th part of the blood of the whole body at a time, and conſequently about 1000 ounces of blood are conveyed through the kidneys in an hour; and it will appear but a moderate allowance for 20 or even 50 ounces of water to diſtil from that quantity of blood in the ſame time. Finally, it is certain, that both men and brutes periſh if the ureters are obſtructed; and in ſuch caſes, we obſerve, that no urine paſſes to the bladder.

(306.) IV. The GLANDULÆ RENALES are two glands ſeated immediately above the kidneys, of no certain figure, nor do we know their uſe; but anatomiſts always deſcribe them along with the urinary parts, becauſe of their ſituation. In a very young fœtus they are larger than the kidneys, and in an adult but a little larger than in the fœtus. They receive a great many ſmall arteries, and return each of them one or two veins. In their inſide is a ſmall ſinus, tinctured with a ſooty coloured liquor.

SECT. VI. *Of the* MALE GENERATIVE ORGANS.

(307.) THE male organs of generation are partly ſituated within and partly without the abdomen. They have been uſually divided into the parts which ſerve to prepare the ſemen from the blood, and thoſe which are deſtined to convey it into the womb. But it ſeems more proper to diſtinguiſh them into the *preparing*, the *containing*, and the *expelling* parts, which are the different offices of the *teſtes*, the *veſiculæ ſeminales*, and the *penis*.

(308.) I. The TESTES are two glandular bodies ſeated in a looſe external membraneous bag called the *ſcrotum*. Their office is to ſeparate the ſemen from the blood. They are ſaid to have four coats, two common and two upper. The common are the outer ſkin, and a looſe membrane or muſcle immediately underneath, called *dartos*. The firſt of the proper is the *tunica vaginalis*. It is continued from the peritonæum to the teſticle, which it incloſes with all its veſſels, but is divided by an adheſion or *ſeptum* immediately above the teſticle; ſo that no fluids can paſs out of that part of this membrane, which incloſes the teſticle.—The other proper coat is the *tunica albuginea*, which is very ſtrong, and which immediately inveſts the teſticles. The teſtes receive each one artery from the aorta, a little below the emulgents. Theſe, unlike all other arteries, ariſe ſmall and dilate in their progreſs, that the velocity of the blood may be ſufficiently abated, for the ſecretion of ſo viſcid a fluid as the ſemen. The right teſticle returns its vein into the cava, and the left into the emulgent vein on the ſame ſide, both becauſe it is the readieſt courſe, and becauſe, as authors ſay, this ſpermatic vein would have been obſtructed by the pulſe of the aorta, if it had croſſed that veſſel to go to the cava. On the upper part of the teſticles, are hard bodies called *epididymi*; which are evidently formed of the *vaſa deferentia*. They may without difficulty be unravelled backward, in ſingle veſſels, and then into more and ſmaller, like the excretory veſſels of ſome other glands.

(309. II. The VASA DEFFERENTIA are excretory ducts to carry the ſecreted ſemen into the *veſiculæ ſeminales*. They paſs from the epididymi of the teſticles, along with the blood-veſſels, till they have entered the muſcles of the abdomen; and then they paſs under the peritonæum, directly through the pelvis, to the veſiculæ ſeminales.

(310. III. The VESICULÆ SEMINALES are two bodies that appear like irregular veſicles. They are ſeated under the bladder near its neck. They may be each of them unfolded into one ſingle duct, which diſcharges into the urethra, by the ſides of the *caput gallinaginis*, which is an eminence in the under ſide of the urethra near the neck of the bladder. In theſe veſicles or ducts, the ſemen is depoſited preparatory to the time of coition; but in dogs there are no veſiculæ ſeminales, therefore nature has given them a large bulb in the penis, which keeps them occupied, ſeemingly againſt their inclination, till the ſeed can be ſecreted and emitted into the uterus of the female. The ſemen paſſes from the veſiculæ in men in time of coition, through proſtate glands into the urethra, and is thence emitted.

(311.) IV. The GLANDULÆ PROSTATÆ are two glands, or rather one, about the ſize of a nutmeg. They lie between the veſiculæ ſeminales and penis, under the oſſa pubis, almoſt within the pelvis. They ſeparate a limpid glutinous humour which is carried into the urethra by ſeveral ducts, that enter near thoſe of the proſtatæ. This liquor ſeems deſigned to be mixed with the ſemen in the time of coition, in order to make it flow more eaſily through two ſhort paſſages, which open into the urethra cloſe to a little eminence called *verumontanum*.

(312.) V. The PENIS is the vehicle or active organ of procreation. It is compoſed of two columns the *corpora cavernoſa* and *corpus ſpongioſum*. The former, which conſtitute the greateſt part of the penis, are two cylindrical ligamentous tubes compoſed of minute cells of a ſpongy texture, which communicate with each other. Theſe two bodies are of a very pliant texture, and capable of conſiderable diſtenſion; and being united laterally to each

each other, occaſion by this union, a ſpace above, and another below. The uppermoſt of theſe ſpaces is filled by the blood veſſels, and the lower one, which is the largeſt, by the uretha and its corpus ſpongioſum. Theſe two cavernous bodies are at firſt only ſeparated by a partition of tendinous fibres, which allow them to communicate with each other; but they afterwards divaricate from each other, like the branch of a tree, and diminiſhing gradually in ſize, are attached, one on each ſide, to the inferior portion of the os pubis.

(313.) The CORPUS SPONGIOSUM PENIS, begins as ſoon as the uretha has paſſed the proſtate, with a thick origin almoſt like a heart, firſt under the urethra, and afterwards above it, becoming gradually thinner, and ſurrounding the whole canal of the urethra, till it terminates in a conſiderable expanſion, and conſtitutes what is called the *glans penis*, which is exceedingly vaſcular, and covered with papillæ like the tongue. The penis is inveſted by the common integuments, but the cutis reflected back from the glans, and covering it in a relaxed ſtate, is called *prepuce*. The prepuce is tied down to the under part of the glans by a ſmall ligament called *frænum*, which is in fact only a continuation of the cuticle and cutis.

(314.) VI. The URETHRA is a membranous canal, paſſing from the bladder through the whole extent of the penis. It affords a conveyance to the ſemen, which we have obſerved is occaſionally diſcharged into it from the veſiculæ ſeminales. The direction of this canal being firſt under and then before the pubis, occaſions a winding in its courſe from the bladder to the penis, not unlike the turns of the letter S.

(315.) The penis has three pairs of muſcles, the *erectores*, *acceleratores*, and *tranſverſales*. Its arteries are chiefly derived from the internal iliacs. Some of them are ſuppoſed to terminate by pervious orifices within the corpora cavernoſa, and corpus ſpongioſum; and others in veins. Its nerves are large and numerous. They ariſe from the great ſciatic nerve, and accompany the arteries in their courſe through the organ. The penis being of a ſpongy texture, the blood is conſtantly paſſing into its cells, through the ſmall branches of the arteries which open into them, and is from thence as conſtantly returned by the veins, ſo long as the corpora cavernoſa and corpus ſpongioſum continue to be in a relaxed and pliant ſtate. But when, through the influence of deſire, the erectores penis, &c. contract, the veins undergo a degree of compreſſion, and the paſſage of the blood through them is ſo much impeded, that it collects in them in a greater proportion than they are enabled to carry off.—Hence the penis gradually enlarges; and being more and more forcibly drawn up againſt the os pubis, the vena magna itſelf is at length compreſſed, and the penis becomes erect.

SECT. VII. *Of the* FEMALE GENERATIVE ORGANS.

(316.) ANATOMICAL writers uſually divide the female organs of generation into *external* and *internal*. In the firſt diviſion they include the *mons veneris*, *labia pudendi*, *clitoris*, *nymphæ*, and *caruncuiæ myrtiformes*; and in the latter, the *vagina*, with the *uterus*, and the parts connected with it.

(317.) I. The MONS VENERIS is that conſiderable riſing of fat which is covered with hair, and ſituated above the *foſſa magna* upon the os pubis. The great doubling of the ſkin, on each ſide the rima, forms the *labia*; and within theſe there is a leſſer doubling, named *nymphæ*. Theſe help to cloſe up the orifice of the vagina; and alſo anſwer certain uſeful purpoſes in parturition.

(318.) II. The CLITORIS is a ſmall ſpongy body, bearing ſome ſlight analogy and reſemblance to the penis in men; but it has no perforation.—It begins with two crura from the oſſa iſchia, and uniting under the oſſa pubis, it proceeds to the upper part of the nymphæ, where it ends under a ſmall doubling of ſkin, called *præputium*: the end which is thus covered, is called *glans*. This part has been ſuppoſed the chief ſeat of a woman's pleaſure in coition, as the glans penis is in men, but this is ſomewhat doubtful. A little below the clitoris, juſt within the vagina, is the exit of the *meatus urinarius*, which forms a ſmall riſing or nipple.

(319.) III. The VAGINA is ſeated between the bladder and rectum. The texture of it is membranous, and its orifice is contracted by muſcles, which act like a ſphincter; yet the poſterior extremity of it is ſufficiently capacious. The inner or poſterior extremity of this great canal ſurrounds the orifice of the uterus, a little obliquely, in ſuch a manner as that the upper ſide of the canal lies very near the orifice, and the lower ſide at a greater diſtance from it; and this makes the extremity of the uterus appear to advance more into the canal, on the lower than on the upper part.

(320.) IV. The anterior extremity of the vagina in virgins, and eſpecially before the menſes appear, is commonly bordered by *circuli membranoſi*, or circular membranous folds, more or leſs ſmooth, and ſometimes ſemilunar; which, in ſome ſubjects, leaves but a very ſmall opening, but in others, a larger, and in all, renders the external orifice narrower than the reſt of the cavity. This fold, called *hymen*, (from the god of marriage,) is formed by the union of the internal membrane of the great canal, with that on the inſide of the alæ, and repreſents a membranous circle of different breadths, and ſometimes uneven. This membranous circle is ruptured in coitu; quite loſt in delivery, and afterwards only ſome irregular portions of it remain; which, from their ſuppoſed reſemblance to myrtle leaves, have been termed *caruncuiæ myrtiformes*.

(321.) V. The UTERUS is ſeated at the termination of the vagina. In the virgin ſtate, it is about one inch thick, two broad, and large enough to contain the kernel of a nut; but in women, that have had children, it is larger. Its orifice into the vagina is called *os tincæ*, from the reſemblance it bears to a tench's mouth. It has two round ligaments which go from the ſides of it to the groins, through the oblique and tranſverſe muſcles of the abdomen, in the ſame manner as the ſeminal veſſels in men. It is by this way that the gut paſſes, in a hernia inteſtinalis in women.

women. Near theſe are the *ligamenta lata*, which are nothing more than a duplicate of the peritonæum.

(322.) VI. Near the ſides of the uterus, and attached to the ligaments, are two bodies, called OVARIA. Theſe are of a depreſſed oval figure, about half the ſize of men's teſticles, and have ſpermatic veſſels. They contain ſmall pellucid eggs, from which circumſtance they take their name. There are two arteries and two veins which paſs to and from theſe ovaries or teſtes, in the ſame manner that they do in men; but make many more windings, and the arteries dilate more ſuddenly, in proportion as they are ſhorter.—Theſe arteries and veins detach branches into the uterus and fallopian tubes, and not only form communications between the artery and vein on one ſide and thoſe of the other, but alſo with the proper veſſels of the uterus, which are detached from the internal iliac arteries and veins. From the minute branches of theſe veſſels within the uterus, the menſtrual evacuations are performed.

(323.) VII. The FALLOPIAN TUBES, (ſo named from Fallopius, who firſt diſcovered them,) are too flaccid, conical, and vermiform canals, ſituated tranſverſely on each ſide of the uterus, between the fundus and the lateral parts of the pelvis, and included in the anterior duplicatures of the ligamenta lata. Each of them is fixed by its narrow extremities in the corner of the fundus uteri, into which it opens, though by ſo narrow a duct as hardly to admit a large briſtle. From thence their diameter augments by degrees all the way to the other extremity, where it is about one third of an inch. The body of each tube goes in a winding courſe, and its large extremity is bent towards the ovaria. Theſe large extremities terminate by a narrow orifice, a little plaited and turned toward the ovarium, where it preſently expands in the form of a membranous fringe, called *fimbria*, or *morſus diaboli*, whoſe office is to receive the ovum in the time of coition, and convey it into the uterus through the fallopian tubes.

SECT. VIII. *Of* CONCEPTION, *and of the* FOETUS IN UTERO.

(324.) I. THE ſubjects of CONCEPTION and GENERATION have employed the philoſophical world in all ages: but in following nature up to her minute receſſes, the philoſopher ſoon finds himſelf bewildered, and his imagination often ſupplies that which he ſo eagerly wiſhes to diſcover, but which is deſtined perhaps never to be revealed to him. Of the many theories which have been formed on this ſubject, that of the ancient philoſophers ſeems to have been the moſt ſimple: they conſidered the male ſemen as alone capable of forming the fœtus, and believed that the female only afforded it a lodging in the womb, and ſupplied it with nouriſhment after it was perfectly formed.

(325.) This opinion, however, ſoon gave place to another, in which the female was allowed a more conſiderable ſhare in conception. This ſecond ſyſtem conſidered the fœtus as being formed by the mixture of the ſeminal liquor of both ſexes, by a certain arrangement of its ſeveral particles in the uterus. But in the 16th century, veſicles or eggs were diſcovered in the ovaria or female teſticles; the fœtus had been found ſometimes in the abdomen, and ſometimes in the Fallopian tubes; and the two former opinions were exploded in favour of a new doctrine. The ovaria were compared to a bunch of grapes, being ſuppoſed to conſiſt of veſicles, each of which had a ſtalk; ſo that it might be diſengaged without hurting the reſt, or ſpilling the liquor it contained. Each veſicle was ſaid to include a little animal, almoſt complete in all its parts; and the vapour of the male ſemen being conveyed to the ovarium, was ſuppoſed to produce a fermentation in the veſicle, which approached the neareſt to maturity; and thus inducing it to diſengage itſelf from the ovarium, it paſſed into the tubæ Fallopianæ, thro' which it was conveyed to the uterus. Here it was ſuppoſed to take root like a vegetable ſeed, and to form, with the veſſels originating from the uterus, what is called the *placenta*; by means of which the circulation is carried on between the mother and the fœtus.

(326.) This hypotheſis, with all its abſurdities, continued to be almoſt univerſally adopted till the cloſe of the ſame century, when Lieuwenhoeck, by means of his glaſſes, diſcovered certain opake particles, which he deſcribed as ſo many animalcula, floating in the ſeminal fluid of the male. This diſcovery introduced a new ſchiſm among the philoſophers of that time, and gave riſe to a ſyſtem which is not yet entirely exploded. According to this theory, the male ſemen paſſing into the tubæ Fallopianæ, one of the animalcula penetrates into the ſubſtance of the ovarium, and enters into one of its veſicles or ova. This impregnated ovum is then ſqueezed from its huſk, through the coats of the ovarium, and being ſeized by the fimbriæ, is conducted through the tube to the uterus, where it is nouriſhed till it arrives at a ſtate of perfection.

(327.) In this ſyſtem there is much ingenuity; but there are certain circumſtances ſuppoſed to take place, which have been hitherto inexplicable. M. Buffon has endeavoured to reſtore the moſt ancient opinion, by allowing the female ſemen a ſhare in its office; aſſerting, that animalcula or organic particles are to be diſcovered in the ſeminal liquor of both ſexes. He derives the female ſemen from the ovaria, and he contends that no ovum exiſts in thoſe parts. But in this idea he is evidently miſtaken; and the opinion now moſt generally adopted is, that an impregnation of the ovum, by the influence of the male ſemen, is eſſential to conception. Of this, indeed, there can be no doubt: but as the manner in which ſuch impregnation is ſuppoſed to take place, and the means by which the ovum afterwards gets into the Fallopian tube, and from thence into the uterus, are ſtill accounted for chiefly by conjecture, we will not attempt to extend farther the inveſtigation of a ſubject, concerning which ſo little can be advanced with certainty.

(328.) II. In treating of the FOETUS IN UTERO which, till the human figure can be diſtinctly perceived, is only ſtiled *Embryo*, we cannot help recollecting the obſervation of the poet,

T

To how *minute* an origin, we owe
Bold Ammon, Cæsar, and the great Nassau!

(329.) As opportunities of dissecting the human gravid uterus occur but seldom, the state of the embryo, immediately after conception, cannot be perfectly known. When the ovum descends into the uterus, it is supposed to be very minute; and it is not till a considerable time after conception, that the rudiments of the embryo begin to be ascertained. About the 3d or 4th week the eye may discover the first lineaments of the fœtus; but these lineaments are as yet very imperfect, it being only about the size of a common fly. Two little vesicles appear in almost transparent jelly; the largest of which is destined to become the head of the fœtus, and the other is reserved for the trunk. But at this period no extremities are to be seen; the umbilical cord appears only as a very minute thread, and the placenta does not as yet absorb the red particles of the blood.

(330.) At six weeks, not only the head but the features of the face begin to be developed. The nose appears like a small prominent line, and we are able to discover another line under it, which is destined for the separation of the lips. Two black points appear in the place of eyes, and two minute holes mark the ears. At the sides of the trunk, both above and below, we see 4 minute protuberances, which are the rudiments of the arms and legs.

(331.) At the end of 8 weeks, the body of the fœtus is upwards of an inch in length, and both the hands and feet are to be distinguished. The upper extremities are found to increase faster than the lower ones, and the separation of the fingers is accomplished sooner than that of the toes. At this period the human form may be decisively ascertained;—all the parts of the face may be distinguished, the shape of the body is clearly marked out, the haunches and the abdomen are elevated, the fingers and toes are separated from each other, and the intestines appear like minute threads.

(332.) At the end of the 3d month, the fœtus measures about 3 inches; at the end of the 4th month, 5 inches; in the 5th month, 6 or 7 inches; in the 6th month, 8 or 9 inches; in the 7th month, 11 or 12 inches; in the 8th month, 14 or 15 inches; and at the end of the 9th month or full time, from 18 to 22 inches. But as we have not an opportunity of examining the same fœtus at different periods of pregnancy, and as their size and length may be influenced by the constitution and mode of life of the mother, calculations of this kind are very uncertain. It would be improper to add more upon this subject here, as the posture and nourishment of the fœtus in utero, and the description of the chorion, amnion, liquor amnii, placenta, &c. fall necessarily to be discussed under MIDWIFERY, to which we, therefore, refer the reader.

PART V. INTERNAL SARCOLOGY.

SECT. I. *Of the* THORAX.

(333.) WITHOUT repeating the remarks already made, in our introduction to Part III, we shall but just observe here, that under INTERNAL SARCOLOGY, we mean only to comprehend the THORAX, with its *anterior* coverings and general contents; all the other *fleshy* parts of the body having been already described either under Myology, external Sarcology, Adenology, or Splanchnology.

(334.) The THORAX, or CHEST, is that cavity of the trunk which extends from the clavicles, or the lower part of the neck, to the diaphragm, and includes the vital organs, which are the heart and lungs; and likewise the pleura, mediastinum, trachea, œsophagus and thymus; the two last of which we have already described: Part III. Sect. VII. and Part IV. Sect. III.

(335.) This cavity is separated from that of the abdomen, by a fleshy and membranous septum, called the *diaphragm*. It is formed by the ribs and vertebræ of the back, covered by a great number of muscles, and by the common integuments, and anteriorly by two glandular bodies called the *mammæ*. The spaces between the ribs are filled up by the muscular fibres, which from their situation are called *intercostal muscles*. Before we proceed to describe the contents of the thorax, we shall give a particular description of its anterior coverings, which, in the female sex at least, are of so much importance to man, upon his entrance into the world.

SECT. II. *Of the* MAMMÆ.

(336.) I. THE MAMMÆ, or *breasts*, are two eminences, more or less round, situated in the anterior and a little towards the lateral parts of the thorax; their centre, or middle part, lying almost opposite to the bony extremity of the sixth true rib on each side. Their size and figure vary in the different sexes and in persons of different ages. In children of both sexes, and in males of all ages, they are commonly no more than cutaneous tubercles, or soft verrucæ of a reddish colour, called *papillæ* or *nipples*; each of them being surrounded by a small, thin, and pretty broad circle or disk, more or less of a brownish colour, and an uneven surface, termed *areola*.

(337.) In females who have arrived at the age of puberty, which is sometimes sooner, sometimes later, a third part is joined to the two former, which is a convex protuberance, more or less round, of about 5 or 6 fingers in breadth; the papilla and areola being situated near the middle of its convex surface. This is what is properly called *mamma*; and it may be termed the *body of the breast*, when compared with the other two parts. It increases with age, and is very large in women with child, and in those that give suck. In old age it decreases and becomes flabby, losing its natural consistence and solidity.

(338.) II. The BODY *of the* MAMMA is partly glandular, and partly consists of fat; or it is a gland of the conglomerate kind, surrounded on all sides with cellular substance and fat. The glandular part is divided into little masses, separated also by fat, and again divided into small granulæ, from which the lactiferous ducts arise. The cellulous pelliculæ support a great many blood vessels, lymphatics, and serous or lactiferous ducts, together with the small glandular mo-

leculæ already mentioned; all of them being closely surrounded by two membranes continued from the pelliculæ. The innermost of these two membranes, which is in a manner the basis of the body of the mamma, is thick, and almost flat, adhering to the musculus pectoralis major. The second or external membrane, is thinner, forming a particular integument for the body of the mamma, more or less convex, and adhering closely to the skin.

(339.) III. The CORPUS ADIPOSUM of the mamma, in particular, is a spungy cluster, more or less interlarded with fat, or a collection of membraneous pelliculæ, which, by the particular disposition of their outer sides, form a kind of membrane in shape of a bag, in which all the rest of the corpus adiposum is contained. The anterior, or outer portion of this bag, or that which touches the skin, is very thin; but that side next the pectoralis major is thick.

(340.) IV. The globular body contains a white mass, which is merely a collection of membranous ducts, narrow at their origin, broad in the middle, and which contract again as they approach the papilla, near which they were supposed by some to form a circle of communication; but, from the observations of the latest anatomists, the ducts have little or no communication with each other at this place. They are named *ductus lactiferi*; and, in their course, are accompanied by a ligumentous elastic substance, which terminates with them in the nipple. Both this substance, and the ducts it contains, are capable of considerable extension and contraction; but, in their natural state, they are moderately corrugated, so as to prevent an involuntary flow of milk, unless the distending force be very great, from the accumulation of too great a quantity.

(341.) V. The AREOLA, *i. e.* the coloured circle, or disk, already mentioned, is formed by the skin; the inner surface of which sustains a great number of small glandular moleculæ, of that kind which Morgagni calls *glandulæ sebaceæ*. They appear very plainly all over the areola, even on the outside, where they form little flat heights or eminences, at different distances, quite round the circle. These tubercles are perforated by small holes, through which a kind of sebaceous matter, more or less liquid, is poured out to defend the areola and nipple. Sometimes one or more of the lactiferous ducts have been found to terminate upon the surface of the areola. Hence Morgagni was led to think that the glands there are of the lactiferous kind.

(342.) VI. The tubercle which lies in the centre of the areola, is termed PAPILLA, or the *nipple*. It is of different sizes in different ages and constitutions, and in the different constitutions of females in particular. In women with child, or who gave suck, it is large, and generally longer or higher than it is thick or broad; and when it happens to be short it causes great uneasiness to the child. The texture of the nipple is spongy, elastic, and liable to divers changes of consistence, being sometimes harder, sometimes more flaccid. It seems to consist chiefly of ligamentary fasciculi; the extremities of which form the basis and apex of the nipple. These fasciculi appear to be gently folded, or curled, during their whole length; and though, by drawing the fibres out, these folds seem to be obliterated, they return again as soon as that action ceases.

(343.) From 12 to 15, or 20 particular TUBES are lodged between these spongy and elastic fasciculi, at a small distance from each other, and all in the same direction. These tubes go to the basis of the papilla, and run through the apex by the same number of almost imperceptible holes and orifices; and as they are closely united to the elastic fasciculi, they are folded in the same manner with them.

(344.) The papillæ are covered by a thin cutaneous production, and by the epidermis. Its outer surface is uneven, being full of small tubercles and wrinkles; among which, those near the circumference of the nipple seem to have a transverse or annular disposition, which, however, is not uniform. This direction seems to be owing to the elastic folds already mentioned: and, from this simple structure, it is easy to explain how infants, in sucking the nipple, and women in drawing the teats of cows, bring out the milk. For the excretory tubes, being wrinkled in the same manner as the fasciculi, do, by those wrinkles or folds, as by so many valves, hinder the milk contained in the ducts from flowing out; but, when the nipple is drawn and elongated, the tubes lose their folds, and the passage becomes straight. Besides this, when they are drawn with a considerable force, the whole body of the mamma is increased in length, and contracted in breadth, and thereby the milk is pressed into the open tubes; and thus, by barely pressing the body of the breast, the milk may be forced toward the nipple, and even through the tubes. Those, who understand the principles of the air pump, will readily conceive the manner in which the child draws out the milk.

(345.) VI. The ARTERIES and VEINS, distributed through the mammæ, are ramifications of the arteriæ and venæ mammariæ; of which one kind comes from the sub-claviæ, and are named *mammariæ internæ*; the others from the auxillares, called *mamariæ externæ*. These vessels communicate with each other, with those near them, and with the vasa epigastrica. The nerves come chiefly from the costales, and, by means of these, communicate with the nervi sympathetici. The mamma has numerous lymphatic vessels, which Wrisberg observes run in two sets: Most of these vessels gradually collect into a great plexus, which go to the axillary glands; but others enter the thorax, through the interstices of the ribs, near the sternum, and communicate with the glands behind the mammary vessels.

(346.) The MILK, examined chemically, appears to be composed of oil, mucilage, and water, and of a considerable quantity of sugar. The generality of physiologists have supposed that like the chyle, it frequently retains the properties of the aliment and medicines taken into the stomach; but from some late experiments, this supposition appears to be ill founded.

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SECT. III. *Of the* DIAPHRAGM, PLEURA, *and* MEDIASTINUM.

(347.) I. THE DIAPHRAGM, or *midriff*, is chiefly compoſed of muſcular fibres; and on this account ſyſtematic writers uſually place it among the muſcles. Its middle part is tendinous, and is covered by the pleura above, and by the peritonæum below. It ſeems to have been improperly named *ſeptum tranſverſum*, as it does not make a plane tranſverſe diviſion between the thorax and the abdomen, but forms a kind of vault, the fore part of which is attached to the ſternum. Laterally it is fixed to the laſt of the true ribs, and to all the falſe ribs; and its lower and poſterior part is attached to the vertebræ lumborum, where it may be ſaid to be divided into two portions of crura.

(348.) The principal arteries of the diaphragm are derived from the aorta, and its veins paſs into the vena cava. Its nerves are chiefly derived from the cervical pairs. It affords a paſſage to the vena cava through its tendinous part, and to the œſophagus through its fleſhy portion. The aorta paſſes down behind it, between its crura. The diapragm not only ſerves to divide the thorax from the abdomen, but by its muſcular ſtructure is rendered one of the chief agents in reſpiration. When its fibres contract, its convex ſide, which is turned towardsthe thorax, becomes gradually flat, and by increaſing the cavity of the breaſt, affords room for a complete dilatation of the lungs, by means of the air which is then drawn into them by the act of inſpiration. The fibres of the diaphragm then relax; and as it reſumes its former ſtate, the cavity of the thorax becomes gradually diminiſhed, and the air is driven out again from the lungs by a motion contrary to the former one, called *expiration*.

(349.) The diaphragm likewiſe ſerves ſeveral other purpoſes in the animal œconomy. It is in ſome meaſure, by means of it, that we void the feces at the anus, and empty the urinary bladder. The acts of coughing, ſneezing, ſpeaking, laughing, gaping, and ſighing, could not take place without its aſſiſtance; and the gentle preſſure, which all the abdominal viſcera receive from its conſtant and regular motion, cannot fail to aſſiſt in the performance of the ſeveral functions which were aſcribed to thoſe viſcera.

(350.) II. The PLEURA is a fine membrane which lines the whole cavity of the thorax, and envelopes the whole of its contents, in the ſame way as the peritoneum incloſes the contents of the abdomen. An inflammation of this membrane conſtitutes the diſeaſe called pleuriſy.

(351.) The pleura is plentifully ſupplied with arteries and veins, from the internal mammary and the intercoſtals. Its nerves, which are very inconſiderable, are derived chiefly from the dorſal and intercoſtal nerves. The ſurface of the pleura, like that of the peritonæum, and other membranes lining cavities, is conſtantly bedewed with a ſerous moiſture, which prevents adheſions of the viſcera.

(352.) III. The MEDIASTINUM is formed by the union of the two lateral portions of the pleura, and divides the thorax lengthways into two cavities, one for each lobe of the lungs. At the lower part of the thorax, theſe laminæ afford a lodgement to the heart: and at the upper part of the cavity, they receive between them the thymus. The mediaſtinum does not, however, divide the thorax exactly in the middle, but towards the left ſide; and is ſo diſpoſed, that the two cavities, into which it divides the thorax, do not end toward this membrane in an angle, but a ſegment of a circle.

(353.) Its uſe is to prevent one lobe of the lungs from preſſing on the other, as in lying on one ſide the uppermoſt might do. But it is of ſtill more importance, in preventing the diſorders of one lobe of the lungs from affecting the other; for if the functions of both lobes were ſuſpended by any diſeaſe at the ſame time, death muſt enſue. If, for inſtance, the point of a ſword were to penetrate between the ribs into the cavity of the thorax, the lungs on that ſide would ceaſe to perform their office; becauſe the air being admitted through the wound, would prevent the dilatation of that lobe; but the other lobe, which is ſeparated from it by the mediaſtinum, would remain unhurt, and continue to perform its function as uſual.

SECT. IV. *Of the* TRACHEA, *the* LUNGS, *and* RESPIRATION.

(354.) THE TRACHEA, or *windpipe*, is a cartilaginous and membraneous canal, through which the air paſſes into the lungs. Its upper part, which is called the LARYNX, is compoſed of five cartilages. The uppermoſt of theſe cartilages is placed over the glottis or mouth of the larynx, and is called *epiglottis*, which performs the office of cloſing the paſſage to the lungs in the act of ſwallowing. At the ſides of the glottis are placed the two arytenoide cartilages, which are of a very complex figure, not eaſy to be deſcribed.

(355.) The anterior and larger part of the larynx is made up of two cartilages, one of which is called *thyroides* or *ſcutiformis*, from its being ſhaped like a buckler; and the other *cricoides* or *annularis*, from its reſembling a ring. Both theſe cartilages may be felt immediately under the ſkin, at the fore part of the throat: where the thyroides, by its convexity, forms an eminence called *Pomum Adami*, which is uſually more conſiderable in the male than in the female ſubject.—All theſe cartilages are united to each other by means of very elaſtic, ligamentous fibres; and are enabled, by the aſſiſtance of their ſeveral muſcles, to dilate or contract the paſſage of the larynx, and to perform that variety of motion, which ſeems to point out the larynx as the principal organ of the voice: for when the air paſſes out through a wound in the trachea, it produces no ſound. Theſe cartilages are moiſtened by a mucus, which ſeems to be ſecreted by minute glands ſituated near them. The upper part of the trachea is covered anteriorly and laterally by a conſiderable body, which is ſuppoſed to be of a glandular ſtructure; and from its ſituation near the thoyrid cartilage is called the *thyroid gland*; though its excretory duct has not yet been diſcovered, or its real uſe aſcertained.

(376.) The GLOTTIS is interiorly covered by

a very fine membrane, which is moiſtened by a conſtant ſupply of a watery fluid. From the larynx, the canal begins to take the name of *trachea* or *aſpera arteria*, and extends from thence as far down as the third or fourth vetreba of the back, where it divides into two branches, which are the right and left bronchial tubes. Each of the bronchi ramifies through the ſubſtance of that lobe of the lungs, to which it is diſtributed by an infinite number of branches, which are formed of cartilages ſeparated from each other like thoſe of the trachea, by an intervening membranous and ligamentary ſubſtance. Each of theſe cartilages is of an angular figure; and as they become gradually leſs and leſs in their diameter, the lower ones are in ſome meaſure received into thoſe above them, when the lungs, after being inflated gradually collapſe by the air being puſhed out from them in expiration. As the branches of the bronchi become more minute, their cartilages become more and more angular and membranous, till at length they are found to be perfectly membranous, and at laſt become inviſible.

(357.) The trachea is furniſhed with fleſhy or muſcular fibres; ſome of which paſs through its whole length longitudinally, while the others are carried round it in a circular direction; ſo that by the contraction or relaxation of theſe fibres, it is enabled to ſhorten or lengthen itſelf, and likewiſe to dilate or contract the diameter of its paſſage. The trachea and its branches, in all their ramifications, are furniſhed with a great number of ſmall glands which are lodged in their cellular ſubſtance, and diſcharge a mucous fluid on the inner ſurface of theſe tubes.

(358.) As the cartilages of the trachea keep it conſtantly open, they afford a free paſſage to the air, which we are obliged to reſpire inceſſantly and its membranous part, by being capable of contraction and dilatation, enables us to receive and expel the air in a greater or leſs quantity, and with more or leſs velocity, as may be required in ſinging or in declamation. This membranous ſtructure of the trachea poſteriorly ſeems likewiſe to aſſiſt in the deſcent of the food, by preventing that impediment to its paſſage down the œſophagus, which might be expected if the cartilages were complete rings. The trachea receives its arteries from the carotid and ſubclavian arteries, and its veins paſs into the jugulars. Its nerves ariſe from the recurrent branch of the 8th pair, and from the cervical plexus.

(359.) II. The LUNGS are compoſed of two lobes, one ſeated on each ſide of the mediaſtinum. Each of theſe lobes is ſubdivided into two or three lobules, a kind of ſtructure particularly diſtinguiſhable in ſuch animals as have much motion in their backs, and for the ſame end that the liver is in the ſame animals. Their ſubſtance is compoſed of very ſmall cells, which are the extremities of the *trachea anteria*, or *bronchos*. The figure of theſe cells is irregular; yet they are fitted to each other ſo as to have common ſides, and leave a void ſpace. Within theſe cells there is ſecreted a quantity of mucus, and alſo a large quantity of the materia perſpirabilis, which at once keeps the lungs from being dried by the air, and produces the neceſſary diſcharge from the blood, which alſo takes place by perſpiration through the ſkin. Throughout the whole texture of theſe cells are diſtributed the branches of the pulmonary artery and vein, which ramify to an infinite degree of minuteneſs, and ſupply the laſt mentioned ſecretions.

(360.) The pulmonary artery and vein, however, are not intended for the nouriſhment of the lungs; but the blood, in its paſſage through them, requires certain eſſential properties from the action of the air, which it had loſt in circulating through the reſt of the body. The lungs are nouriſhed from the arteriæ bronchiales, whoſe ramifications are ſeen creeping every where on the branches of the bronchi. The blood is brought back from them into the vena azygos by the bronchial vein.

(361.) III. RESPIRATION conſtitutes one of thoſe functions which are improperly termed *vital* as being eſſential to life; for to live and to breathe are in fact ſynonymous terms. It conſiſts in an alternate contraction and dilatation of the thorax, by firſt inſpiring air into the lungs, and then expelling it from them in expiration. It will perhaps be eaſy to diſtinguiſh and point out the ſeveral phenomena of reſpiration: but to explain their phyſical cauſe will be attended with difficulty: for it will naturally be enquired, how the lungs, when emptied of the air, and contracted by expiration, become again inflated, they themſelves being perfectly paſſive? How the ribs are elevated in oppoſition to their own natural ſituation? and why the diaphragm is contracted downwards towards the abdomen? Were we to aſſert that the air, by forcing its way into the cavity of the lungs dilated them, and conſequently elevated the ribs, and preſſed down the diaphragm, we ſhould ſpeak erroneouſly.

(362.) What induces the firſt inſpiration, it is not eaſy to aſcertain; but after an animal has once reſpired, it would ſeem likely that the blood, after expiration, finding its paſſage through the lungs obſtructed, becomes a ſtimulus, which induces the intercoſtal muſcles and the diaphragm to contract, and enlarge the cavity of the thorax, in conſequence perhaps of a certain nervous influence, which we will not here attempt to explain. The air ruſhes into the lungs; every branch of the bronchial tubes, and all the cellular ſpaces into which they open, become fully dilated; and the pulmonary veſſels being equally diſtended, the blood flows through them with eaſe. But as the ſtimulus which firſt occaſioned this dilatation ceaſes to operate, the muſcles gradually contract, the diaphragm riſes upwards again, and diminiſhes the cavity of the cheſt; they return to their former ſtate; and as the air paſſes out in expiration, the lungs gradually collapſe, and a reſiſtance to the paſſage of the blood again takes place. But the heart continuing to receive and expel the blood, the pulmonary artery begins again to be diſtended, the ſtimulus is renewed, and the ſame proceſs is repeated, and continues to be repeated, in a regular ſucceſſion during life.

(363.) Although the muſcles of reſpiration, having a mixed motion, are in ſome meaſure dependent on the will, yet no human being, after having

having once reſpired, can live many moments without it. In attempting to hold one's breath, the blood ſoon begins to diſtend the veins, which are unable to empty their contents into the heart; and we are able only, during a very ſhort time, to reſiſt the ſtimulus to inſpiration. In drowning, the circulation ſeems to be ſtopped upon this principle; and in hanging, the preſſure made on the jugular veins, may co-operate with the ſtoppage of reſpiration to bring on death.

(364.) Phyſiologiſts, till within theſe few years, were entirely ignorant of the uſe of reſpiration.—It was at length diſcovered in part by the illuſtrious Dr Prieſtley. He found that the air expired by animals was phlogiſticated; and that the air was fitter for ſupporting animal life, in proportion as it was freer from the phlogiſtic principle. It had long been obſerved, that the blood in paſſing through the lungs acquired a more florid colour. He therefore ſuſpected, that it was owing to its having imparted phlogiſton to the air: and he ſatisfied himſelf of the truth of this idea by experiments, which ſhowed, that the craſſamentum of extravaſated blood phlogiſticated air in proportion as it loſt its dark colour. He farther found, that blood thus reddened had a ſtrong attraction for phlogiſton: inſomuch that it was capable of taking it from phlogiſticated air, thereby becoming of a darker colour. From hence it appeared that the blood, in its circulation through the arterial ſyſtem, imbibes a conſiderable quantity of phlogiſton, which is diſcharged from it to the air in the lungs.

(365.) This diſcovery has ſince been proſecuted by ſeveral ingenious phyſiologiſts. It had been ſhown by profeſſors Black and Irvine, that different bodies have different capacities for containing fire; *e. g.* that oil and water, when equally hot to the ſenſe and the thermometer, contain different proportions of that principle; and that unequal quantities of it are required, in order to raiſe thoſe ſubſtances to like temperatures. The enquiries of Dr Crawford and Mr Elliot tend to prove, that the capacities of bodies for containing fire are diminiſhed by the addition of phlogiſton, and increaſed by its ſeparation. Common air contains a great quantity of fire; combuſtible bodies very little. In combuſtion, a double elective attraction takes place: the phlogiſton of the body being transferred to the air, and the fire contained in the air to the combuſtible body. But as the capacity of the latter is not increaſed ſo much as that of the former is diminiſhed, only part of the extricated fire will be abſorbed by the body. The remainder therefore will raiſe the temperature of the compound; and hence we may account for the heat attending combuſtion. As the uſe of reſpiration is to dephlogiſticate the blood, it ſeems probable that a like double elective attraction takes place in this proceſs; the phlogiſton of the blood being transferred to the air, and the fire contained in the air to the blood; but with this difference, that the capacities being equal, the whole of the extricated fire is abſorbed by the latter. The blood in this ſtate, circulating through the body, imbibes phlogiſton, and of courſe gives out its fire; part only of which is abſorbed by the parts furniſhing the phlogiſton, the remainder, as in combuſtion, becoming ſenſible; and is therefore the cauſe of the heat of the body, or what is called *animal heat*.

(366.) Next to the preſervation of life, the moſt important uſe of reſpiration ſeems to be, that of forming the *voice* and ſpeech. The ancients and almoſt all the moderns have conſidered the organ of ſpeech as a kind of muſical inſtrument, which may be compared to a flute, to an hautboy, to an organ, &c. and they argue after the following manner. The trachea, which begins at the root of the tongue, and goes to terminate in the lungs, may be compared to the pipe of an organ, the lungs dilating like bellows during the times of inſpiration; and as the air is driven out from them in expiration, it finds its paſſage ſtraitened by the cartilages of the larynx, againſt which it ſtrikes. As theſe cartilages are more or leſs elaſtic, they occaſion in their turn more or leſs vibration in the air, and thus produce the ſound of the voice; the variation in the ſound and tone of which depends on the ſtate of the glottis, which, when ſtraitened, produces an acute tone, and a grave one when dilated. Several ingenious theories have been founded on theſe principles, but none that we have yet ſeen appear fully ſatisfactory.

SECT. V. *Of the* PERICARDIUM *and the* HEART, *with its* VENTRICLES *and* AURICLES.

(367.) I. THE PERICARDIUM is a ſtrong membranous capſula, which incloſes the heart in a two-fold manner; for, after ſurrounding the heart, it is itſelf ſurrounded by a reflexion of its own ſubſtance. It is made up of three laminæ, the middle and chief of which is compoſed of very fine tendinous filaments, cloſely interwoven, and croſſing each other in different directions. The internal lamina ſeems to be a continuation of the outer coat of the heart, auricles, and great veſſels. The uſes of the pericardium are, to keep the heart in its place without interrupting its office; to keep it from having any injurious friction with the lungs; and to contain a liquor to lubricate its own ſurface and that of the heart, ſo as to prevent the friction which would otherwiſe happen between both. This is a coagulable lymph, and is called *liquor pericardii*.

(368.) The arteries of the pericardium are derived from the phrenic, and its veins paſs into veins of the ſame name; its nerves are likewiſe branches of the phrenic. The ſize of the pericardium is adapted to that of the heart, being uſually large enough to contain it looſely. As its cavity does not extend to the ſternum, the lungs cover it in inſpiration; and as it every where inveſts the heart, it effectually ſecures it from being injured by lymph, pus, or any other fluid, extravaſated into the cavities of the thorax.

(369.) II. The HEART is a hollow muſcle of a conical ſhape, ſituated tranſverſely between the two laminæ of the mediaſtinum, at the lower part of the thorax; having its baſis turned towards the right ſide, and its point or apex towards the left. Its lower ſurface is ſomewhat flattened towards the diaphragm. Its baſis, from which the great veſſels originate, is covered with fat, and it has two hollow and fleſhy appendages, called *auricles*.—Round theſe ſeveral openings, the heart ſeems to be

be of a firm ligamentous texture, from which all its fibres originate; and as they advance from thence towards the apex, the ſubſtance of the heart ſeems to become thinner.

(370.) III. The heart includes two VENTRICLES, or cavities which are ſeparated from each other by a fleſhy ſeptum; one of theſe is called the *right*, and the other the *left ventricle*. The heart is externally covered by a very fine membrane; and its ſtructure is perfectly muſcular or fleſhy, being compoſed of fibres paſſing in different directions; ſome longitudinally from the baſis to the apex; others in an oblique or ſpiral courſe; and a third ſort placed in a tranſverſe direction.

(371.) Within the two ventricles we obſerve ſeveral furrows; and there are likewiſe tendinous ſtrings, which ariſe from fleſhy *columnæ* in the two cavities, and are attached to the valves of the auricles. That the uſe of theſe and the other valves of the heart may be underſtood, it muſt be obſerved, that four large veſſels paſs out from the baſis of the heart, viz. two arteries and two veins; and that each of theſe veſſels is furniſhed with a thin membranous production, which is attached all round to the borders of their ſeveral orifices, from whence hanging looſely down they appear to be divided into two or three diſtinct portions. But as their uſes in the arteries and veins are different, ſo are they differently diſpoſed. Thoſe of the arteries are intended to give way to the paſſage of the blood into them from the ventricles, but to oppoſe its return; and, on the contrary, the valves of the veins are conſtructed ſo as to allow the blood only to paſs into the heart.

(372.) In conſequence of theſe different uſes, we find the valves of the pulmonary artery and of the aorta attached to the orifices of thoſe veſſels, ſo as to have their concave ſurfaces turned towards the artery; and their convex ſurfaces, which mutually meet together, being placed towards the ventricle, only permit the blood to paſs one way, viz. into the arteries. There are uſually three of theſe valves belonging to the pulmonary artery, and as many to the aorta; and from their figure they are called *valvulæ ſemilunares*. The communication between the two great veins and the ventricles is by means of the two appendages or auricles into which the blood is diſcharged; ſo that the other valves which may be ſaid to belong to the veins are placed in each ventricle, where the auricle opens into it.

(373.) The VALVES in the right ventricle are uſually 3, and are named *valvulæ tricuſpides*; but in the left ventricle we commonly obſerve only 2, and theſe are the *valvulæ mitrales*. The membranes which form theſe valves in each cavity are attached ſo as to project ſomewhat forward; and both the *tricuſpides* and the *mitrales* are connected with the tendinous ſtrings, which were deſcribed as ariſing from the fleſhy *columnæ*.

(374.) By the contraction of either ventricle, the blood is driven into the artery which communicates with that ventricle; and theſe tendinous ſtrings being gradually relaxed, as the ſides of the cavity are brought nearer to each other, the valves naturally cloſe the opening into the auricle, and the blood neceſſarily directs its courſe into the then only open paſſage, which is into the artery; but after this contraction, the heart becomes relaxed, the tendinous ſtrings are again ſtretched out, and, drawing the valves of the auricle downwards, the blood is poured by the veins into the ventricle, from whence, by another contraction, it is again thrown into the artery. The right ventricle is not quite ſo long, though ſomewhat larger than the left; but the latter has more ſubſtance than the other: and this ſeems to be, becauſe it is intended to tranſmit the blood to the moſt diſtant parts of the body, whereas the right ventricle diſtributes it only to the lungs.

(375.) IV. The AURICLES are two muſcular bags, ſituated at the baſis of the heart, at the ſides of each other; and, correſponding with the two ventricles, are like thoſe two cavities diſtinguiſhed into *right* and *left*. Theſe ſacs, which are interiorly unequal, have externally a jagged appendix; which, from its having been compared to the extremity of an ear, has given them their appellation of auricles.

(376.) From the par vagum and intercoſtals the heart is ſupplied with nerves. The arteries which are diſtributed to it, ariſe from the aorta, and are called *coronary arteries*. From theſe the blood is returned into the auricles by the *coronary veins*.

SECT. VI. *Of the* ACTION *of the* HEART, AURICLES, *and* ARTERIES.

(377.) THE heart, at the time it contracts, drives the blood from its ventricles into the arteries; and the arteries being thus diſtended, are naturally inclined to contract the moment the heart begins to dilate, and ceaſes to ſupply them with blood. Theſe alternate motions of contraction and dilatation of the heart and arteries, are diſtinguiſhed by the names of *ſyſtole* and *diaſtole*. When the heart is in a ſtate of ſyſtole, or contraction, the arteries are at that inſtant diſtended with blood, and in their diaſtole; and it is in this ſtate we feel their pulſatory motion, which we call the PULSE. When the heart dilates, and the arteries contract, the blood is impelled onwards into the veins, thro' which it is returned back to the heart. While the heart, however, is in its ſyſtole, the blood cannot paſs from the veins into the ventricles, but is detained in the auricles, which are two reſervoirs formed for this uſe, till the diaſtole, or dilatation of the heart, takes place; and then the diſtended auricles contract, and drive the blood into the ventricles: ſo that the auricles have an alternate ſyſtole and diaſtole as well as the heart.

(378.) Though both the ventricles contract at ſame time, yet the blood paſſes from one to the other. In the ſame moment, for inſtance, that the left ventricle drives the blood into the aorta, the right ventricle impells it into the pulmonary artery, which is diſtributed through all the ſubſtance of the lungs. The blood is afterwards brought back into the left ventricle by the pulmonary vein, at the ſame time that the blood is returned by the cava, into the right ventricle, from all the other parts of the body. This ſeems to be the mode of action of the heart and its veſſels.

(379.) The cauſe of this action has, like all other intricate and intereſting ſubjects, been differently

rently explained. It ſeems to depend on the ſtimulus made on the different parts of the heart by the blood itſelf, which by its quantity of heat, or other properties, is perhaps capable of firſt exciting that motion, which is afterwards continued through life, independent of the will, by a return of blood to the auricles, in a quantity proportioned to that which is thrown into the arteries. The heart poſſeſſes the *vis inſita*, or principle of irritability, in a much greater degree than any other muſcle of the body. The pulſe is quicker in young than in old ſubjects, becauſe the former are *cæt. par.* more irritable than the latter. Upon the ſame principle we may explain, why the pulſe is conſtantly quicker in weak than in robuſt perſons.

(380.) The FORCE, which the heart exerts at every ſyſtole, has been computed by Borelli, to be equal to 3000lb. weight; that, which all the arteries exert at every ſyſtole, is equal to 16,000lb. weight; and that the heart and arteries together overcome a force equal to 136,000lb. weight; whilſt Dr Keill has computed, that the heart in every ſyſtole exerts a force not exceeding eight ounces. The firſt computation was made by comparing the heart, with other muſcles, whoſe power to ſuſtain a weight could be beſt determined; and the latter was made from the velocity of the blood moving in an artery. If therefore, we conſider that Borelli's way of computing led him to find out the abſolute force of the heart, and Dr Keill's the force which the heart uſually exerts, perhaps theſe very different computations may be accounted for; for if the force of the heart, which is conſtantly exerted, ſhould, compared with any other muſcle, be but in a reciprocal proportion to the frequency of their actions, and the importance of their uſes; may not the heart very fitly have a force vaſtly greater than uſually it exerts, becauſe it is always in action, and muſt be able to exert a certain force in the loweſt ſtate of health?

(381.) What force the heart ever exerts in a grown man, it is difficult to ſay; but it muſt be leſs in each ventricle than is ſufficient to burſt the valves, which hinder the blood from returning into the auricles out of the ventricles, or than is ſufficient to break thoſe threads by which theſe valves are tied to the papillæ. Experiments made upon living animals ſufficiently evince the impulſe and rapidity, with which the blood is moved, particularly through the arteries. The height to which blood aſcended from the carotids, when cut, according to Hale's calculation, Dr Wriſberg has confirmed in robuſt men who were beheaded. It is generally about ſeven feet, with this difference, however, that in two examples the blood ſprung higher from the vertebrals than from the carotids. In the larger trunks it runs ſwifteſt, but in the leaſt of them ſomewhat ſlower. In the larger veins, the celerity of the blood is leſs than in the arterial trunks, in the ſame proportion as the ſections of the arteries are leſs than thoſe of the veins, *i. e.* twice or almoſt thrice as ſlow. The motion of the blood through the veins is uniform or equable; but in the arteries, it is alternately greater when the veſſel is more dilated, and leſs when it is contracted. This indeed is proved by ocular inſpection in living animals.

SECT. VII. *Of the* NATURE *and* CIRCULATION *of the* BLOOD.

(382.) Dr HARVEY long ago ſuggeſted, that the blood is poſſeſſed of a LIVING PRINCIPLE; and the late Mr J. Hunter endeavoured to revive this doctrine; in ſupport of which he adduced many ingenious arguments. Dr James Corrie has alſo publiſhed *An Eſſay on the Virtuality of the Blood*, wherein he urges many ſtrong arguments in ſupport of this opinion. The doctrine appears likewiſe to be confirmed by ſcripture, where the vital principle of the blood is aſſigned as a reaſon for prohibiting the eating of it: "But fleſh with the "*life* thereof, which is the *blood* thereof, ſhall you "not eat." The ſubject is curious, and deſerves to be proſecuted, as an enquiry which cannot but be intereſting to phyſiologiſts.

(383.) Blood, recently drawn from a vein, would ſeem to be an homogeneous fluid of a red colour; but when ſuffered to reſt, it ſoon coagulates and divides into two parts, which are diſtinguiſhed by the names of *craſſamentum* and *ſerum*. The craſſamentum is the red coagulum, and the ſerum is the water in which it floats. Each of theſe may be again ſeparated into two others; for the craſſamentum, by being repeatedly waſhed in warm water, gives out all its red globules, and what remains appears to be compoſed of the coagulable lymph, which is a gelatinous ſubſtance, capable of being hardened by fire till it becomes perfectly horny; and if we expoſe the ſerum to a certain degree of heat, part of it will be found to coagulate like the white of an egg, and there will remain a clear and limpid water, reſembling urine both in appearance and ſmell. Till of late the *coagulable lymph* has been confounded with the *ſerum* of the blood, which contains a ſubſtance that is likewiſe coagulable, though only when expoſed to heat, or combined with certain chemical ſubſtances; whereas the other coagulates ſpontaneouſly, when expoſed to the air or to reſt. The ſerum and craſſamentum differ in their proportion in different conſtitutions; in a ſtrong perſon, the craſſamentum is in a greater proportion to the ſerum than in a weak one; and the ſame difference is found to take place in diſeaſes.

(384.) When the blood ſeparates into *ſerum* and *craſſamentum*, if the latter be covered with a cruſt of a whitiſh or buff colour, it has been uſually conſidered as a proof of the blood being in a ſtate of too great viſcidity. This appearance, commonly taking place in inflammatory diſeaſes, has long ſerved to confirm the theory, which aſcribes the cauſe of inflammation to laxor and obſtructions. But from the late Mr Hewſon's experiments it appears, that when the action of the arteries is increaſed, the blood, inſtead of being more viſcid, is, on the contrary, more fluid than in the ordinary ſtate, previous to inflammation: and in conſequence of this, the coagulable lymph ſuffers the red globules, which are the heavieſt part of the blood, to fall down to the bottom before it coagulates; ſo that the craſſamentum is divided into two parts; one of which is found to conſiſt of the coagulable lymph alone

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(in this case termed the *buff*); and the other, partly of this, and partly of the red globules.

(385.) By putrefaction alone, or the dissolving power of the air, in a heat equal to 96 degrees, the whole mass, but especially the serum dissolves into a fœtid liquor; the serum, first, and the cruor more slowly, till at length the whole mass, both of serum and cruor, is turned into a volatile and fœtid exhalation, leaving very few fœces behind. The blood, being a little dissolved by the beginning putrefaction, becomes fœtid; with the fœtor it assumes an alkaline nature, and effervesces with acids. This property it afterwards loses, the alkaline salt being destroyed by the complete putrefaction. The putrid blood cannot by any art be inspissated, and it is very difficult to resolve it, after it has been coagulated by spirit of wine. By too severe exercise, heat, and malignant disorders, the cohesion of the blood is dissolved, and it assumes an alkaline nature, almost as if from putrefaction.

(386.) The blood contains in its substance a quantity of *sea salt*, which is discernible to the taste, and sometimes visible by the microscope. That there is *earth* in the blood is demonstrated from nutrition, and from a chemical analysis; and this earth is chiefly found in the most fluid, and especially in the oily parts of the blood. By some late experiments, it appears, that a considerable quantity of ferruginous earth, easily reducible into metal by the addition of phlogiston, is contained in blood when calcined. Another part of the blood is *air* in an unelastic state, and that in a very considerable quantity, as is proved by putrefaction and distillation, or by removing the ambient air by the pump; but we are not to suppose that the blood globules are bubbles full of air, for they are specifically heavier than the serum. By the admixture of neutral salts the colour of the blood becomes deeper and brighter, without its being either dissolved or thickened. It is scarcely altered by a weak acid. By fermented liquors it is coagulated. Fixed alkaline salts have almost the same effect as neutral. The volatile alkalies rather turn it brown, and coagulate it. Alcohol, distilled oils, and vinegar, coagulate it. It does not effervesce with any salt.

(387.) After what has been observed of the structure and action of the heart and its auricles, there seem to be few arguments required to demonstrate the CIRCULATION *of the blood*, which has long ago been established as a medical truth. This circulation may be defined to be a perpetual motion of the blood, in consequence of the action of the heart and arteries, which impel it thro' all the parts of the body, from whence it is brought back by the veins to the heart. A very satisfactory proof of this circulation, and a proof easy to be understood, may be deduced from the different effects of pressure on an artery and a vein. If a ligature is passed round an artery, the vessel swells considerably between the ligature and the heart; whereas if we tie up a vein, it only becomes filled between the extremity and the ligature, and this is what we every day observe in bleeding. The ligature we pass round the arm on these occasions, compresses the superficial veins; and the return of the blood through them being impeded, they become distended. When the ligature is too loose, the veins are not sufficiently compressed, and the blood continues its progress towards the heart; and, on the contrary, when it is made too tight, the arteries themselves become compressed, and the flow of the blood through them being impeded, the veins cannot be distended.

(388.) Another effectual proof of the circulation, is the loss of blood that every living animal sustains, by opening only a single artery of a moderate size; for it continues to flow from the wounded vessel till the equilibrium is destroyed, which is essential to life. This truth was not unknown to the ancients; and it seems strange, that it did not lead them to a knowledge of the circulation, as it sufficiently proves, that all the other vessels must communicate with that which is opened. Galen, who lived more than 1500 years ago, drew this conclusion, from it; and if we further observe, that he describes, (after Eristratus who flourished about 450 years before him) the several valves of the heart, and determines their disposition and uses, it will appear wonderful that a period of near 2000 years should afterwards elapse before the true course of the blood was ascertained. This discovery, for which we are indebted to the immortal Harvey, has thrown new lights on physiology, and the doctrine of diseases, and constitutes one of the most important periods of anatomical history.

PART VI. ANGEIOLOGY.

INTRODUCTORY REMARK.

(389.) ANGEIOLOGY has hitherto been restricted, by most anatomists, to the description of the BLOOD VESSELS, though the literal meaning of the word admits of no such restriction. The word, ΑΓΓΕΙΟΛΟΓΙΑ, is derived from ἀγγεῖον, a vessel, and λόγος, a description or treatise; and therefore signifies a description of *vessels in general*. As we can perceive no reason for this restricted application of the word, unless it be that Galen applied it to the doctrine of the blood vessels, at a period, when a great number of other vessels, since discovered in the human body, were quite unknown, we mean to use it in its original and extensive sense; by comprehending not only the blood vessels, but likewise the Lacteals, Lymphatics, and other branches of the absorbent system, under this division of our subject.

SECT. I. *Of the* ARTERIES *and* VEINS.

(390.) WE have already observed, (Part V. sect. VI.) that the heart contracts itself, and throws the blood from its two ventricles into the pulmonary artery and the aorta, and then relaxes itself and receives a fresh supply from the pulmonary vein and the vena cava. We will now point out the principal distributions of the blood vessels.

(391.) From the right ventricle of the heart arises the PULMONARY ARTERY, which soon divides into two branches, one to each lobe of the lungs. They then subdivide into smaller and smaller branches, until they are distributed thro' every part of the lungs. From the extreme branches of the pulmonary artery arise the small branches of the pulmonary veins; which, as they approach

proach the left auricle of the heart, unite in a manner ſimilar to the ramifications of the pulmonary artery in its egreſs from the heart; except that the veins enter the muſcular appendix of the left auricle in ſeveral branches, and the blood being brought back from the lungs by theſe veſſels to the left auricle and ventricle of the heart, is from the left ventricle of the heart thrown into the aorta.

(392.) The AORTA, or GREAT ARTERY, ariſes from the left ventricle of the heart, and deals out branches to every part of the body. The firſt part of this veſſel is called aorta aſcendens. It paſſes over the left pulmonary artery, and veins, and branch of the trachea, and being reflected under the left lobe of the lungs, it commences aorta deſcendens; which name it keeps through the thorax and abdomen, where it paſſes on the left ſide of the ſpine, till its diviſion into the iliac arteries between the third and fourth vertebræ of the loins.

(393.) From beneath two of the ſemilunar valves of the aorta, and ere it leaves the heart, ariſe two branches, which are beſtowed upon the heart itſelf, as we juſt now obſerved, and which are called CORONARIÆ CORDIS. From the curved part of the aorta, which is about two or three inches above the heart, ariſe the ſubclavian and carotid arteries; the right ſubclavian and carotid in one trunk, but the left ſingle.

(394.) The CAROTID ARTERIES run on both ſides the larynx to the ſixth foramina of the ſkull, through which they enter and proceed to the brain; but as they paſs through the neck, they detach branches to all the adjoining parts. Theſe branches are called by the names of the parts they are beſtowed upon; as, laryngeæ, thyoridæ, pharyngeæ, linguales, temporales, occipitales, faciales, &c. but juſt before they enter the ſixth foramina of the ſkull, they each ſend a ſmall branch through the fifth foramina to that part of the dura mater, which contains the cerebrum. Theſe arteries make thoſe impreſſions that are conſtantly obſerved on the oſſa bregmatis: theſe branches, however, often ariſe from the temporal arteries.

(395.) The INTERNAL CAROTIDS ſend two branches to the back part of the noſe, and ſeveral branches through the firſt and ſecond foramina of the ſkull to the face and parts contained within the orbit of the eyes, and then piercing the dura mater, they each divide into two branches, one of which they ſend under the falx of the dura mater, between the two hemiſpheres of the brain, and the other between the anterior and poſterior lobes. Theſe branches take a great many turns, and divide into very ſmall branches in the pia mater, before they enter the brain becauſe the pulſe of larger arteries would make too violent an impreſſion on ſo tender and delicate a part.

(396.) Beſides the carotids, the brain has other two arteries, called CERVICALES, which ariſe from the ſubclavian arteries, and aſcend to the head through the foramina, in the tranſverſe proceſſes of the cervical vertebræ, and into the ſkull through the tenth or great foramen. Theſe two arteries uniting ſoon after their entrance, ſend branches to the cerebellum, and then paſſing forwards, divide and communicate with the carotids: and the carotid arteries anaſtomoſing with each other, there is an entire communication between them all; and theſe interpoſing branches are ſo large that every one of theſe four great veſſels, with all their branches, may be eaſily filled with the common wax injections through any one of them.

(397.) The SUBCLAVIAN ARTERIES are each continued to the cubit in one trunk, which is called *axillaris* as it paſſes the arm pits, and *humeralis* as it paſſes by the inſide of the os humeri, between the muſcles that bend and extend the elbow. From the ſubclavians within the breaſt ariſe the *arteriæ mammariæ*, which run on the inſide of the ſternum, and lower than the cartilago enſiformis. Soon after the arteria humeralis has paſſed the joint of the cubit, it divides into two branches, called *cubitalis ſuperior*, and *cubitalis inferior*; which latter ſoon ſends off a branch called *cubitalis media*, which is beſtowed upon the muſcles ſeated about the elbow.

(398.) The CUBITALIS SUPERIOR paſſes near the radius, and round the root of the thumb, and gives one branch, to the back of the hand, and two to the thumb; one to the firſt finger, and a branch to communicate with the cubitalis inferior. The CUBITALIS INFERIOR paſſes near the ulna to the palm of the hand, where it takes a turn, and ſends one branch to the outſide of the little finger; another between that and the next finger, dividing to both; another in the ſame manner to the two middle fingers; and another to the two fore-fingers. Theſe branches, which are beſtowed on the fingers, run one on each ſide of each finger internally to the top, where they have ſmall communications, and very often there is a branch of communication between the humeral and inferior cubital arteries. This communicant branch is ſometimes very large, and liable to be pricked in opening the baſilic vein, immediately under which, this branch almoſt always lies. See Plate VII. ARTERIES.

(399.) From the deſcending aorta on each ſide, is ſent a branch under every rib, called INTERCOSTALIS, and about the fourth vertebra of the back, it ſends off two branches to the lungs, called *bronchiales*, which are ſometimes both given off from the aorta, ſometimes one of them from the intercoſtal of the fourth rib on the right ſide. As the aorta paſſes under the diaphragm, it ſends two branches into the diaphragm, called *arteriæ phrenicæ*, which ſometimes riſe in one trunk from the aorta, and ſometimes from the cœliac. Immediately below the diaphragm ariſes the *cœliac artery* from the aorta. It ſoon divides into ſeveral branches, which are beſtowed upon the liver, pancreas, ſpleen, ſtomach, omentum, and duodenum. Theſe branches are named from the parts they are beſtowed on, except two that are ſent to the ſtomach, and which are called *coronaria ſuperior* and *inferior*, and the branch running on the duodenum, which is named *inteſtinalis*.

(400.) At a very ſmall diſtance below the arteria cœliaca from the aorta, ariſes the MESENTERICA SUPERIOR, whoſe branches are diſtributed upon the whole of the inteſtinum jejunum and ilium, part of the colon, and ſometimes one

branch upon the liver. A little lower than the superior meſentric artery ariſe the *emulgents*, which are the arteries of the kidneys; and a little lower than the emulgents, anterior to the aorta, ariſe the *arteriæ ſpermaticæ*, which are diſtributed to the genital parts in men. Laterally, and lower down, the aorta ſends branches to the loins, called *lumbales*; and one forward, to the lower part of the colon and the rectum, called *meſenterica inferior*. Between the arteria cœliaca, meſenterica ſuperior and inferior, and the branches of each near the inteſtines, there are large communicant branches to convey the blood from one to another, when they are either compreſſed by excrements, or from any other cauſe.

(401.) The aorta, as ſoon as it divides upon the loins, ſends off an artery into the pelvis upon the os ſacrum, called *arteria ſacra*; and the branches into which the aorta divides, are called *iliacæ*. Theſe again, at about the diſtance of two inches, divide into external and internal. The iliaceæ internæ firſt ſend off the umbilical arteries which are obliterated in adult bodies, except at their beginnings, which are kept open for the collateral branches on each ſide, one to the bladder, and one to the penis in men, and in women to the uterus. The reſt of theſe branches are beſtowed upon the glutæi muſcles, and upper part of the thighs. The iliacæ externæ run over the oſſa pubis into the thighs; and as they paſs out of the abdomen, they ſend off branches, called *epigaſtricæ*, to the fore part of the integuments of the abdomen, under the recti muſcles. The epigaſtric arteries ſend each a branch into the pelvis, and through the foramina of the oſſa innominata, to the muſcles thereabouts.

(402.) As ſoon as the iliac artery has paſſed out of the abdomen into the groin, it is called *inguinalis*, and in the thigh *cruralis*. Here it ſends a large branch to the back part of the thigh; but the great trunk is continued internally between the flexors and extenſors of the thigh, and paſſing through the inſertion of the triceps muſcle into the ham, it is there called *poplitea*. It then, below the joint, divides into two branches, one of which is called *tibialis antica*, which paſſes between the tibia and fibula down the fore part of the leg, and is beſtowed upon the great toe, and one branch to the toe next to the great one, and another between theſe toes, to communicate with the *tibialis poſtica*; which artery, ſoon after it is divided from the antica, ſends off the *tibialis media*, which is beſtowed upon the muſcles of the leg. The tibialis poſtica goes to the bottom of the foot and all the leſſer toes. The tibialis antica is diſpoſed like the cubitalis ſuperior; the poſtica like the cubitalis inferior; and the mediæ in each have alſo like uſes. Theſe arteries are uniform in moſt bodies, but the leſſer branches are diſtributed like the branches of trees, in ſo different a manner in one body from another, that it is highly probable no two bodies are exactly alike, nor even the two ſides in any one ſubject.

(403.) The VEINS ariſe from the extremities of the arteries, and compoſe trunks which accompany the arteries in almoſt every part of the body, and bear the ſame names. The veins of the brain unload themſelves into the ſinuſes, and the ſinuſes into the internal jugulars and cervicals; and the internal jugulars and cervicals into the ſubclavians, which joining, make the cava deſcendens. The internal jugulars are ſeated near the carotid arteries, and receive the blood from all the parts which are ſupplied by the carotids, except the hairy ſcalp and part of the neck, whoſe veins enter into the external jugulars, which run immediately under the muſculus quadratus genæ, often two on each ſide.

(404.) The CERVICAL VEINS deſcend, two through the foramina in the tranſverſe proceſſes of the cervical vertebræ, and two through the great foramen of the ſpine, and on each ſide the ſpinal marrow. Theſe join at the loweſt vertebra of the neck, and then empty into the ſubclavians, and at the interſtices of all the vertebræ communicate with each other.

(405.) The VEINS *of the* EXTREMITIES are more than double the number of the arteries, there being one placed on each ſide of each artery, even to the ſmalleſt branches that we can trace, beſides the veins which lie immediately under the ſkin. Thoſe which accompany the arteries, have the ſame names with the arteries. Thoſe which run immediately under the ſkin on the back of the hand, have no proper names; they run from thence to the bend of the elbow, where the uppermoſt is called *cephalica*, the next *mediana*, and the laſt *baſilica*. Theſe all communicate near the joint of the elbow, and then ſend one branch which is more directly from the cephalica, and bears that name until it enters the *ſubclavian* vein. It paſſes immediately under the ſkin, in moſt bodies, between the flexors and extenſors of the cubit, on the upper ſide of the arm. The other branches joining, and receiving thoſe which accompany the arteries of the cubit, they paſs with them by the artery of the arm into the ſubclavian vein. The *cephalic* vein, as it runs up the arm, is very viſible in moſt men, but in children is rarely to be ſeen.

(406.) In the thorax, beſides the two cavæ, there is a vein called AZYGOS, or *vena ſine pari*. It is made up of the intercoſtal, phrenic, and bronchial veins, and enters the deſcending cava near the auricle, as if its uſe was to divert the deſcending blood from falling too directly upon the blood in the aſcending cava, and to direct the blood of the deſcending cava into the auricle.

(407.) In the abdomen, beſides the cava aſcendens, and other veins which are named like the arteries, there is one large vein, called VENA PORTÆ. Its branches ariſe from all thoſe of the cœliac and two meſenteric arteries, except thoſe branches of the cœliac and ſuperior meſenteric, which are beſtowed on the liver, and uniting in one trunk, enter the liver. In this ſituation it is again diſtributed like an artery, and has its blood collected and brought into the cava by the branches of the cava in the liver; this vein being made uſe of, inſtead of an artery to carry blood to the liver, for the ſecretion of bile. The blood moves here conſiderably ſlower than in the arteries, this ſlow circulation being probably neceſſary for the ſecretion of the bile.

(408.) In the leg the veins accompany the arteries in the ſame manner as in the arm, the external veins of the foot being on the upper ſide; and

from them is derived one called *saphena*, which is continued on the inside of the limb through its whole length, and has different names given it, according to the different places through which it passes.

(409) The ARTERIES have *three coats* each; the middle one muscular, and the external and internal membranous. The VEINS are said to have the same, though this is to be doubted. The internal coat of an artery may be pretty easily separated, but not the external; but though the veins have muscular fibres, it is not very possible to separate any one of them distinctly into three coats. In the inside of the veins there are many valves, especially in the lower extremities. These hinder any reflux of the venal blood, which otherwise would happen from the frequent action of the muscles on the outsides of the veins. Both the arteries and veins, as they run on the inside of the limb, or as they appear in parts that are liable to great distension, as the stomach, intestines, uterus, &c. are curved in such a manner, as to comply with those distentions by being merely straightened, and without being lessened in their diameters.

(410.) The small arteries near the heart go off from the large trunks at obtuse angles, farther at less obtuse angles, then at right angles, farther still at acute angles, and near the extremities at very acute angles; because the blood in the vessels far from the heart, moving with less velocity than the blood in the vessels near the heart, the blood in the collateral branches more remote from the heart wants the advantage of a more direct course: and because a very large branch arising out of another, might weaken too much the sides of the vessel it would arise from, that inconvenience is prevented by increasing the number, and so lessening the size of the collateral branches, where otherwise one large branch would have served better; as in the going off of the subclavian and carotid arteries, which might have gone off for some space in one trunk; but this mechanism is most evident in the going off of the arteria cœliaca and mesenterica superior. The small arteries always divide so, as that the lesser branches may lie least in the direction of the blood flowing into them, which makes the blood flow most freely into that branch that has farthest to carry it; and the smaller branches arise more or less obliquely from the sides of other arteries, according to the proportion they bear to the arteries they arise from; because an artery comparatively large arising obliquely from the side of another, would make an orifice in that it arises from too large, and weaken it. Both these ends are at once brought about, by making the arteries, that give off the branches, bend more or less towards the branches they afford, according to the comparative magnitude of the branches given off.

SECT. II. *Of the* ABSORBENT SYSTEM *in* GENERAL.

(411.) THE absorbent system consists of the lacteals, the lymphatic vessels, the thoracic duct, which is their common trunk, and the conglobate glands.

(412.) I. The LACTEALS begin from the intestinal tube, and can generally be seen in any large quadruped that is killed two or three hours after eating. They then appear filled with a white chyle; but they do not always contain a fluid of this colour; for, if the animal be opened long after a meal, they are found distended with a liquor that is transparent and colourless like the lymph. In birds the chyle is never found white, but always transparent; so that these vessels might, with some propriety, be called the *lymphatics of the intestines*.

(413.) II. The LYMPHATIC VESSELS are small pellucid tubes, that exist in most parts of the human body. Their fluids are generally as colourless as water; a circumstance which procured them at first the name of *ductus aquosi*, and afterwards that of *vasa lymphatica*. The course of the lymph, like that of the chyle, is from the extreme parts of the body towards the centre, and many of the lymphatic vessels lie close to the large blood vessels. If therefore a ligature be made on the blood vessels of the extremities of a living animal, or of one just dead, that ligature, by embracing the lymphatics, will stop the course of the lymph, which, by distending the vessels, will make them visible below the ligature.

(414.) All the lacteals, and most of the lymphatic vessels, open into the thoracic duct, which lies upon the spine, and runs up towards the neck, where it commonly opens into the angle between the internal jugular and subclavian veins of the left side; and thus both the chyle and lymph are mixed with the blood. See Plate VIII. fig. 4. If therefore a ligature be made on the thoracic duct immediately after killing an animal, not only the lacteal, but also the lymphatic vessels, in the abdomen and lower extremities, become distended with their natural fluids, the course of those fluids being stopped by the ligature.

(415.) III. The lacteals, the lymphatics, and the THORACIC DUCT, have their coats thinner and more pellucid than those of the blood vessels. But though their coats are so thin, they are very strong, as we daily see on injecting them with mercury, since they resist a column of that fluid, the weight of which would burst the blood vessels. The thinness prevents our dividing them from one another, and thereby ascertaining their number, as we do those of the blood vessels. But as the blood vessels have a dense internal coat to prevent transudation, we have reason to believe the lymphatics have the same. And as the blood vessels have a muscular coat, which assists in the circulation; so may the lymphatics.

(416.) This is rendered probable from what Haller says of his having found them irritable in his experiments, and also from what is observed on seeing them in living animals distended with their lymph, in which case they appear of a considerable size; but upon emptying them, they contract so much as not to be easily distinguished. This experiment, Mr Hewson informs us, he frequently made in the trunk of the lacteals in a goose, and on the lymphatic vessels on its neck; both of which, when distended with their natural fluids, are as large as a crow quill; but, upon emptying them in the living animal, he has seen them contract so much that it was with the great-

eſt difficulty he could diſtinguiſh them from the fibres.

(417.) The COATS of the lymphatic veſſels have, in common with all other parts of the body, arteries and veins, for their nouriſhment. This is rendered probable by their being ſuſceptible of inflammation; for they are frequently found in the form of a cord, painful to the touch, and extending from an ulcer to the next lymphatic gland. Theſe painful ſwellings of lymphatic veſſels likewiſe ſhow that their coats have ſenſibility, and therefore that they have nerves as well as arteries and veins. Beſides, we can clearly trace, in different parts of the body, blood veſſels running along their ſurfaces.

(418.) In moſt animals, but particularly in man and quadrupeds, the lymphatic veſſels are full of VALVES. Theſe valves have been deſcribed by the celebrated Nuck, Ruyſch, and others, and are much more frequent than in the common veins, and thence theſe lymphatics have ſometimes been diſtinguiſhed by the name of *valvular lymphatic veſſels*. Theſe valves are generally two in number, of a ſemilunar ſhape, and the one ſometimes much larger than the other. In moſt parts of the body theſe valves are ſo numerous, that there are three or four pair in an inch, but ſometimes there is no more than one pair, and ſometimes ſeveral inches appear without a valve. They are leſs numerous in the thoracic duct than in the branches of the ſyſtem; thence it might be ſuppoſed, that in proportion as we go from the trunk to the branches, we ſhould find them in greater number; but this is not always true, for Mr Hewſon obſerved them more numerous in the lymphatic veſſels of the thigh, than on thoſe of the leg. When the veſſels are diſtended with lymph, they appear larger on that ſide of the valves next the heart; which ſometimes gives a lymphatic veſſel an appearance of being made of a chain of veſicles; as ſuch they are repreſented by ſome authors; but it is an appearance that very ſeldom occurs in the human body. In quadrupeds, however, this appearance is very remarkable. Wherever a lymphatic veſſel enters the thoracic duct or a red vein, we find either one or two valves, which prevent the return of the lymph, or hinder the blood from getting into the lymphatic.

(419.) V. The lymphatic ſyſtem, in different parts of its courſe, has the GLANDS called *conglobate*, or LYMPHATIC. Theſe glands are ſo placed, that the veſſels come in on one ſide, and paſs out on the other, on their way to the thoracic duct. They are commonly of an oval, though ſometimes of a round form, and frequently ſomewhat flattened, and of various ſizes, ſome being no larger than a millet ſeed, while others are almoſt an inch in diameter. They vary in colour in different parts of the body, and at different times of life. In young people they are generally of a reddiſh or brown colour, but become paler with age; they have a ſhining external ſurface, which is owing to a ſmooth denſe coat that covers them. Like other glands, they have arteries, veins, and nerves, which enter into their compoſition; but with reſpect to the reſt of their ſtructure, anatomiſts are much divided in opinion; ſome endeavouring to prove that they are formed of cells, while others of equal credit conſider them as a collection of veſſels. Before the diſcovery of the lymphatic veſſels in birds, fiſh, and turtle, ſome anatomiſts conſidered theſe glands as ſo eſſentially neceſſary to the lymphatic ſyſtem, that they generally ſet about diſcovering the veſſels by firſt looking for the glands; and wherever they found glands, they pronounced that there muſt be veſſels; and when no glands could be ſeen, they thought it as certain a proof of there being no veſſels. But that the glands are wanting in ſome animals, is now generally known.

SECT. III. *Of the* LYMPHATICS *of* PARTICULAR PARTS.

(420.) FROM the preceding general deſcription of the Abſorbent Syſtem, it appears, that, beſides the glands, it is divided into three parts, viz. the *lacteals*, the *lymphatic veſſels*, and the *thoracic duct*. The lacteals belong to the inteſtinal tube; the lymphatics to all the other parts of the body; and the thoracic duct is the common trunk which receives both the lacteals and lymphatics. Of theſe a copious deſcription has been given by Dr William Hunter, Mr Hewſon, and other anatomiſts, by whoſe induſtry this part of anatomy has been greatly illuſtrated. Since, notwithſtanding their importance in the animal economy, a very minute account of the courſe and number of the lymphatic veſſels in each particular part of the body cannot be of any great degree of practical advantage to the ſtudent, we ſhall not purſue the ſubject to any unneceſſary length.

(421.) The lymphatics may be divided into two kinds, viz. *ſuperficial* and *deep ſeated*.—The SUPERFICIAL LYMPHATICS conſiſt of numerous veſſels that lie between the ſkin and the muſcles, and belong to the ſurface of the body or the ſkin, and to the cellular membrane which lies immediately under it. Numerous large branches of them can be readily enough diſcovered in the limbs of dropſical ſubjects. Many of them run upon the top of the foot; others are generally to be found juſt under the inner ankle. By means of tubes which have been introduced into two of them, the lymphatics have been filled the whole length of the lower extremity. See Pl. VIII. ABSORBENTS.

(422.) The greater number of ſuperficial lymphatics accompany the *vena ſaphena major*. They can be firſt traced from the toes, where they run ſomewhat like the arteries and veins. A plexus, conſiſting of ſeveral veſſels, runs over the top of the foot with the ſaphena to the inner ankle, and from thence upwards to the inner ſide of the knee. Here they are joined by another plexus, which ariſes from the ſole, and paſſes up on the inner and back part of the leg. A third plexus ariſes from the outer ſide of the foot, and runs by the outer ankle. Upon the outer part of the leg theſe ſplit into two diviſions, one of which croſſes obliquely over the fore part of the leg, to the lymphatics at the inner ſide of the knee, while the remaining part accompanies the vena ſaphena minor, and runs to the glandulæ popliteæ. From the inſide of the knee a plexus runs up, conſiſting of from a dozen to twenty trunks, which paſs afterwards on the anterior and inner ſide of the thigh

nigh to the inguinal glands. In their paſſage they receive branches from the outer and back parts of the thigh; but theſe are few in number when compared with the reſt.

(413.) The lymphatic glands of the GROIN, are 6, 7, 8, or upwards, varying much in number. Of theſe, ſome lie in the very angle between the thigh and the abdomen, and others a few inches down on the fore part of the thigh. The lymphatic veſſels, above deſcribed, enter the innermoſt of theſe glands. One or more of theſe branches, however, frequently avoids a gland, and afterwards bends over it to another gland; from which veſſels go to other lymphatic glands that lie in the angle between the thigh and the abdomen, and ſometimes a few enter no glands till they reach thoſe on the inſide of Poupart's ligament.

(414.) Many lymphatics alſo paſs into the inguinal glands, from the ſuperficial parts of the abdomen and pelvis. It is into theſe upper glands alone, that the lymphatic veſſels of the genitals enter, ſo that the venereal bubo, which ariſes in conſequence of an abſorption of matter from the organs of generation, is always ſeated in theſe upper glands; and the lower glands are never affected, except by the regurgitation of the matter, or from the vicinity to the glands firſt diſeaſed, which very ſeldom happens. And, as the upper glands are affected by the abſorption of matter from the genitals, ſo the lower are commonly firſt affected from the abſorption of the acrid matter of an ulcer, diſeaſed joint, or carious bone, in the parts below theſe glands; a circumſtance that may aſſiſt us in the diagnoſis of theſe two kinds of buboes: remembering, however, that this rule may be liable to an exception, from one or more of the lymphatic veſſels paſſing the lower glands, and only entering at the upper.

(415.) In the penis, 2 principal veſſels commonly take their origin from the prepuce. Theſe ſoon unite, but afterwards ſeparate upon the middle of the dorſum penis into two parts; one of which goes to the inguinal glands on the right ſide, the other to thoſe of the left.—The DEEP-SEATED LYMPHATICS ariſe from the glands and body of the penis, and accompany the arteries into the lower part of the pelvis. Hence if venereal matter be abſorbed by theſe veſſels, the conſtitution may be affected without our being aware of it.

(416.) The lymphatic veſſels of the teſticle are numerous, and very large for the ſize of this organ. They ariſe from its coats, from the body of the teſticle, and from the epididymis; and after running along the ſpermatic cord, they terminate in the lumbar glands. In their courſe they have few communications with each other. The lymphatics of the ſcrotum, which are alſo numerous, go chiefly to the glands of the groin, though ſome paſs along with thoſe of the teſticle to the lumbar glands.

(417.) The lymphatic veſſels of the penis and ſcrotum having joined thoſe of the thigh, a net work is formed, which enters the abdomen under the edge of the tendon of the external oblique muſcle, called *Poupart's ligament*. This plexus on the inſide of Poupart's ligament conſiſts of many branches; ſome of which embrace the iliac artery, but the greateſt number of them paſs upon the inſide of the artery.

(418.) The ſuperficial lymphatics of the inferior extremity are the trunks of thoſe veſſels which abſorb from the ſkin and the cellular membrane immediately under it; but they likewiſe communicate with the deep ſeated abſorbents: and the ſame thing is to be obſerved with reſpect to the lymphatics on all the other parts of the ſurface of the body.—Upon theſe veſſels, from the foot to the groin, there are commonly no other lymphatic glands than thoſe of the ham. But this rule has ſome exceptions.

SECT. IV. *Of the* LACTEAL SAC *and* DUCT.

(429.) We ſhall now proceed to give a deſcription of the LACTEAL SAC *and* DUCT, for a view of which ſee PLATE VII. *Fig.* 4. The RECEPTACLE *of the* CHYLE is a membranous bag, ſomewhat pyriform, two thirds of an inch long, one third of an inch over in its largeſt part when collapſed; ſituated on the firſt vertebra of the loins to the right of the aorta, a little higher than the right emulgent artery, behind the right inferior muſcle of the diaphragm. It is formed by the union of three tubes; one from under the aorta the 2d from the interſtice of the aorta and cava, and the 3d from under the emulgents of the right ſide.

(43.) The LACTEAL SAC, becoming gradually ſmaller towards its upper part, is contracted into a ſlender membranous pipe, of about a line diameter, which is generally named the THORACIC DUCT. This paſſes between the muſcular appendices of the diaphragm, on the right of the aorta. It then mounts between the aorta and the vena azygos as far as the 5th vertebra of the thorax, where it is hid by the azygos, as this vein riſes forwards to join the deſcending or ſuperior cava; after which the duct paſſes obliquely over to the left ſide, behind the œſophagus, aorta deſcendens, and the great curvature of the aorta, until it reaches the left carotid artery: behind which, on the left ſide of the œſophagus, it runs to the interſtice of the firſt and ſecond vertebræ, of the thorax, where it begins to ſeparate from the carotid, ſtretching farther towards the left internal jugular vein by a circular turn, whoſe convex part is uppermoſt.

(431.) At the top of this arch it ſplits into two branches for a line and an half; the ſuperior branch receiving into it a large lymphatic veſſel from the cervical glands. When the two branches are again united, the duct continues its courſe towards the internal jugular vein behind which it deſcends, and, immediately at the left ſide of the inſertion of this vein, enters the ſuperior poſterior part of the left ſubclavian vein, whoſe internal membrane being duplicated, forms a ſemilunar valve that is convex externally, and covers two thirds of the orifice of the duct.

(432.) The COATS of the ſac and duct are thin tranſparent membranes; from the inſide of which, in the duct, 10 or 12 ſmall ſemilunar valves are produced, moſt commonly in pairs; which are ſo ſituated as to allow the paſſage of liquors upwards only. This is the moſt ſimple and com-

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thors, as the beginning of the duct. From this part it passes upwards, being at first covered by the crus diaphragmatis, and afterwards appears in the thorax, upon the spine between the aorta and the vena azygos. In the thorax, it receives some lymphatics from the intercostal spaces, and afterwards vessels from the lungs.

(450.) The superficial lymphatics of the LUNGS form a beautiful net-work, the larger branches running chiefly between the lobules, the smaller passing over them; and here, as well as on the liver, and other parts there are numerous valves, the existence of which has been denied by some authors. From the surface they pass to the root of the lungs, and there they go through the bronchial glands. At this place they are joined by the deep-seated absorbents, which creep along the branches of the trachea, and likewise on those of the pulmonary artery and vein.

(451.) Having left the glands, the principal part of those from the left lung form a trunk which terminates in the thoracic duct, behind the division of the trachea into its right and left branches. The rest of the absorbents of the left lobe pass through glands behind the arch of the aorta, and which are likewise common to those of the heart. They run at last into the thoraic duct near its termination in the red veins. After leaving the bronchial glands, the absorbents of the right lung form three or four principal trunks: one of which commonly ascends on the fore part of the vena cava superior, and opens into the lymphatic trunk, that terminates in the veins of the right side of the neck. The rest of these trunks go into the thoracic duct at the root of the lungs; and near this place the absorbents of the right and left lungs communicate pretty freely together.

(452.) There are many glands called BRONCHIAL, at the root of the lungs, where the large blood vessels enter. They generally are of a blackish colour in the human subject, and have been suspected to secret the mucus which is spit up from the trachea: but later anatomists having frequently distinctly filled them with mercury, by injecting the lymphatic vessels of the lungs, think it evident that they are not mucous but lymphatic glands.

(453.) The ABSORBENTS of the HEART, which have been known only by the latest anatomists, come from its superficial and deep parts. These afterwards form principal trunks which accompany the coronary arteries and veins, and like them the largest belong to the left ventricle. From the side of the right coronary artery, an absorbent passes over the arch of the aorta, to a gland commonly found behind the origin of the carotid arteries. The lymphatic, accompanying the left coronary artery, is formed of two principal branches; one of which runs up in the groove between the ventricles, and on the superior surface of the heart; the other runs in a corresponding groove on the under side of the heart; and having reached the space between the auricles and ventricles, turns round to join the former branch near the origin of its corresponding artery. Frequently there are a considerable number on its sides, and upon the lumbar vertebræ.

(454.) There are also lymphatic glands over the trunks of blood-vessels of the spleen, liver kidneys, and renal capsulæ, which belong to the lymphatic vessels of these organs. In the thorax, a few glands are found on the fore part of the pericarpium, and upper surface of the diaphragm, belonging to the liver or diaphragm. Others are situated between the laminæ of the anterior portion of the mediastinum. Lymphatic glands are sometimes observed by the sides of the thoracic duct, particularly about the middle of the thorax: which belong principally to the vessels of the lungs.

(355.) There are likewise many BRONCHIAL lymphatic glands, near the root of the lungs: these glands, are placed upon the lymphatic vessels, where they quit the lungs. But no lympatic glands have yet been observed in the substance of the lungs; and the tubercles, which some suspect to be obstructed lymphatic glands, seem to have a different origin. There are likewise some glands seen on the lymphatic vessels, which lie near the subclavian veins at the upper part of thorax, and which belong to the lungs,

(456.) Besides these, there are some lymphatic glands, upon the aorta near the œsophagus; and there are also others occasionally met with in the intercostal spaces. There are generally two or three contiguous to the thoracic duct, at the lower part of the neck and upper part of the thorax, near the termination of that duct, in the angle between the left jugular and the left subclavian vein; and a few are found over the internal mammary vessels where the absorbents of the liver pass up within the thorax.

PART VII. NEUROLOGY.

SECT. I. *Of the* BRAIN *in* GENERAL *and its* INTEGUMENTS.

(457.) WE cannot with any propriety, enter upon NEUROLOGY, or the *description of the* NERVES, without first describing THEIR FOUNTAIN,—that principal seat of the rational soul, commonly called the BRAIN. This name is given to all that mass which fills the cavity of the cranium, and which is immediately surrounded by two membranes, called Μηνιγγες, *meninges*, by the Greeks: but *matres* by the Arabians, who were of opinion, that these membranes were the origin, and, as it were, the *mothers* of all the other membranes of the body. The name given them, by the Arabians is still retained.

(458.) This general mass is divided into three particular portions; the *cerebrum* or *brain* properly so called, the *cerebellum* and *medulla oblongata*. To these three parts contained within the cranium, a fourth is added, which fills the great canal of the spina dorsi, and is known by the name of *medulla spinalis*, being a continuation of medulla oblongata.

(459.) The INTEGUMENTS of the brain are the two membranes above-mentioned: called *dura mater* and *pia mater*. The first is very strong, and lies contiguous to the cranium; the other is very thin, and immediately touches the brain. The

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pia mater is again divided into two; the external lamina being termed *arachnoides*, the internal retaining the common name of *pia mater*.

(460.) The DURA MATER is a very compact strong membrane, lining the inside of the skull, firmly adhering at its basis, though but slightly at the upper part, except at the sutures. It has 3 processes; the first named FALX, (or the *falciform* process, from its resemblance to a scythe,) begins at the *crista galli*, and runs backwards under the sutura sagittalis to the cerebellum, dividing the cerebrum into two hemispheres. Its use is said to be, that of supporting one side of the cerebrum from pressing on the other, when the head is inclined to one side. But it rather appears calculated to divide the brain into such portions, as are less liable to be disturbed by any violent motions of the head; the under side of the brain being at the same time kept steady by the inequalities of the basis of the skull, which the brain is exactly fitted to. In brutes the falx is always very small; therefore in those that have the brain of a larger size, as oxen, sheep, horse, &c. the upper part of the skull is made uneven, exactly to fit the folds of the brain, which secures the upper parts from concussion, in the same manner that the lower parts are secured. The 2d process runs from the lower and back part of the former to the upper edge of each os petrosum, and sustains the posterior lobes of the cerebrum, that they might not compress the cerebellum. In some animals this process is composed of bone. The 3d is a very small process, which runs from that last described, down towards the great foramen of the skull, and possesses that small space in the cerebellum, between the processus vermiformis. These processes of the dura mater also serve to keep the brain steady.

(461.) The dura mater has in it several SINUSES, which answer the end of large veins to receive the blood from the lesser veins of the brain. Their number is uncertain, and those that are constant are not described in the same order by writers. The first that presents itself is the LONGITUDINALIS SUPERIOR, running from a blind hole a little above the crista galli, all along the upper edge of the falx. A transverse section of this vessel is not circular, like other vessels, but a triangle, whose sides are arches of a circle; the upper side convex outwards, and the two lower convex inwards. The figure of this vessel is preserved by small ligaments running across in the inside, that it might not become conical, or cylindrical, like other vessels, from the equal pressure of the contained blood, and thereby incommode the upper edges of each hemisphere of the cerebrum.

(462.) On the lower edge of this process is generally another very small one, called LONGITUDINALIS INFERIOR. This runs into the rectus, and when wanting, is supplied by a vein. The RECTUS runs between the two first processes of the dura mater, and along with the sinus longitudinalis superior pours into the two lateral sinuses; but for the most part the longitudinal sinus goes more directly into one of the lateral sinuses, and the straight sinus into the other. There is sometimes a small one in the third process, which empties in the same place with the former.

(463.) From the terminations of the longitudinal and straight sinuses, begin the two lateral sinuses, which, when they come to the os petrosum, dip down and pass through the 8th foramina into the internal jugular vein. Another named *circularis*, runs round the fore part only of the cella turcica. The two extremities of this empty into 4 sinuses, one on the top of each os petrosum, which pass into the sinus lateralis, and one at the inferior parts of the same bones, which pass indifferently into both the lateral and cervical sinuses. These two last sinuses have always communicating branches.

(464.) The CERVICAL SINUSES run from the basis of the skull through the great foramen on both sides of the medulla spinalis colli, and thro' the transverse processes of the cervical vertebræ; the last of these have sometimes proper foramina running from the 8th foramina to the back part of the apophysis of the occipital bone. There are also two more of these vessels, which run from the circular sinus, between the os spenoides and the fore part of the os petrosum, directly into the internal jugular veins.

(465.) The PIA MATER is an exceedingly fine membrane immediately investing the brain, even between its lobes, hemispheres, and folds. It serves to contain the brain, and support its blood vessels, which run here in great numbers, and are divided into an infinite degree of minuteness, in order that the blood may not enter the brain too impetuously. Between the dura and pia mater, there is a membrane called TUNICA ARACHNOIDES, which is easily seen at the back part of the cerebrum, upon the cerebellum and back part of the medulla spinalis.

SECT. II. *Of the* CEREBRUM, CEREBELLUM, MEDULLA OBLONGATA, *and* MEDULLA SPINALIS.

(466.) I. THE CEREBRUM is that part of the brain which occupies all the upper and fore part of the cranium; being separated from the cerebellum by the second process of the dura mater. Its upper side is divided into two hemispheres, and its lower side into 4 lobes, two anterior and two posterior, which latter are much the largest. At the meeting of the 4 lobes appears the *infundibulum*, which seems to be a lymphatic, running from the ventricles of the brain into the *glandula pituitaria*: This gland is seated in the cella turcica. Immediately behind the infundibulum, appear two small bodies, named *protuberantiæ duæ albæ pone infundibulum*. Between the two hemispheres of the cerebrum, lower than the circumvolutions, appears a white body named CORPUS CALLOSUM. Under the corpus callosum appear the two lateral or superior ventricles, which are divided into right and left by a very thin membrane, named *septum lucidum*, which is extended between the corpus callosum and fornix.

(467.) The FORNIX is a medullary body beginning from the fore part of these ventricles, with two small roots which soon unite; then running towards the back part, they divide into parts, called *crura fornicis*. In the basis of these two ventricles are 4 prominences: The two anterior are called, from their inner texture, *corpora striata*;

ſtriata; the other two, *thalami nervorum opticorum*. Beyond theſe are other two proceſſes, called *nates*; and under them, nearer the cerebellum, two called *teſtes*.

(468.) Above the nates is ſituated the GLANDULA PINEALIS, famous for being ſuppoſed, by Des Cartes, the ſeat of the ſoul. Upon the thalami nervorum opticorum are a number of blood veſſels, glands, and lymphatics, called *plexus choroides*. Under the beginning of the fornix is a ſmall hole, called *foramen ad radices fornicis*, or *iter ad infundibulum*; and under the middle of the fornix, one called *foramen poſterius*, which is covered with a valve, named *membrana*, or *valvula major*; and the ſpace under the two anterior ventricles, between the foramina and the cerebellum, is the third ventricle.

(469.) II. The CEREBELLUM is ſituated under the ſecond proceſs of the dura mater. By dividing this part of the brain lengthways we diſcover more plainly the fourth ventricle, whoſe extremity is called *calamus ſcriptorius*. Here alſo appear two medullary bodies, called *pedunculi*, which are the baſis of the cerebellum. The medullary part in the cerebellum, though it is inmoſt, as in the cerebrum, yet is of a different ſhape, being branched out like a plant.

(470.) The SUBSTANCE *of the* BRAIN is diſtinguiſhed into outer and inner; the former called *corticalis*, *cinerea*, or *glandulaſa*; the latter *medullaris*, *alba*, or *nervea*.

(471.) III. The MEDULLA OBLONGATA is a medullary continuation of the under part of the cerebrum and cerebellum. It firſt appears in two bodies from the anterior part of the poſterior lobes of the cerebrum, called *crura medullæ oblongatæ*. The union of theſe crura between the cerebrum and cerebellum is called *iſthmus*; and immediately beyond this is an eminence named *proceſſus annularis*.

(472.) IV. The MEDULLA SPINALIS, or SPINAL MARROW, is a production of the medulla oblongata through the great foramen of the ſkull, and through the channel of the ſpine. It enlarges about the laſt vertebra of the back and firſt of the neck, where the large nerves are given off to the arms. It again enlarges in the loins, where the crural nerves begin; and the lower end of it, joined with thoſe and other nerves, is called, from its reſemblance to the tail of a horſe, CAUDA EQUINA. The coats of this part are the ſame with thoſe of the brain; but the membrane here, which is analogous to the dura mater, is thinner and more connected to the bones, and the tunica arachnoides more conſpicuous.

SECT. III. *Of the* NERVES.

(473.) FROM the medulla oblongata and medulla ſpinalis a vaſt number of ſmall medullary white fibres are ſent out, which, at their firſt egreſs, ſeem eaſy to ſeparate; but as they paſs forward are ſomewhat more, but ſtill looſely connected, by the coat which they obtain from the pia mater, and at laſt piercing the dura mater, are cloſely embraced by that membrane, which covers them in their progreſs. Hence they become white, firm, ſtrong cords, and are well known to anatomiſts by the name of NERVES. To theſe coats an infinite number of ſmall veſſels both arteries and veins, are diſtributed.

(474.) Although the NERVES, if all joined together, would hardly make a cord of an inch diameter, yet, from their exiſting in almoſt every part, they would appear to be diſtributed with the utmoſt degree of minuteneſs. In their courſe to the places for which they are deſtined they generally run as ſtraight as the part over which they are to paſs, and their own ſecurity from external injuries, will allow, ſending off their branches at very acute angles, and conſequently running more parallel than the blood veſſels. Their diſtribution is ſeldom different in the oppoſite ſides of the ſame ſubject, nor indeed in any two ſubjects is there any conſiderable variety to be found. Frequent nerves which come out diſtinct or ſeparate, afterwards conjoin into one faſciculus, under the ſame common covering; and though the various fibrils probably do not communicate, yet becauſe the coats at the conjoined part are common, and theſe ſtrong coats may have great effects on the ſoft pulpy nerves, it is evident that ſuch will have a conſiderable ſympathy with one another.

(475.) In ſome parts where theſe conjunctions take place, the ſize of the nerves ſeems much increaſed, and thoſe knotty oval bodies, named GANGLIONS, are formed. The coats of the knots are ſtronger, thicker, and more muſcular than the whole nerves which enter into them would ſeem to conſtitute; while the nervous fibrils paſs through without any great change.

(476.) The nerves are diſtinguiſhed into two claſſes, viz. thoſe of the ENCEPHALON, or *medulla oblongata*, and thoſe proceeding from the *medulla ſpinalis*. Of the firſt there are generally ten pair reckoned, of the laſt thirty. We ſhall deſcribe the nerves in the order in which they are generally ranked, though it is not poſſible to proſecute the diſſection of them after the ſame manner; but to ſupply this deficiency we ſhall afterwards mention the order wherein they may all demonſtrated on one ſubject.

(477.) I. Of the ten pair proceeding from the encephalon, the firſt are the OLFACTORY NERVES, which long had the name of *proceſſus mammillares*, and are ſmall, long, and without any cavity. Riſing from that part of the brain where the carotid arteries are about to enter, and running under the anterior lobes of the brain, they become a little larger, till they reach the os cribriform into the foramina of which the ſmall filaments inſinuate themſelves, and are immediately ſpread on the membrana narium.

(478.) II. The 2d pair are the OPTIC NERVES, which ariſe ſingle from the thalami nervorum opticorum, and then uniting at the fore part of the ſella turcica, ſeem to be pretty much blended. They afterwards divide, and running obliquely forwards, paſs out at their proper orifice in the ſphenoid bone, and enter the globe of the eye to be expanded into the membrana retinæ. The blood veſſels running through the middle of the nerves, and the ramifications of the retina are very obſervable, whence we may account for ſuch objects, as fall on the entry of the optic nerve, being loſt to us.

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(479.) III. The 3d pair of nerves firſt appear at the anterior part of the proceſſus annularis, and going out at the foramen lacerum, are diſtributed to the globe of the eye, muſculus rectus Fallopii, attollens, adducens, deprimens, and obliquus minor; therefore this pair have juſtly got the name of *motores oculorum*.

(480.) IV. The 4th pair, which are the ſmalleſt of all, derive their origin from the anterior lateral part of the proceſſus annularis, and go out at the foramina lacera, to be entirely ſpent on the muſculi trochleares, or obliqui majores oculorum, in which muſcles chiefly the rotatory motion of the eyes in ogling, and their advance forwards in turning, is to be attributed. For theſe reaſons anatomiſts have called theſe nerves PATHETICI.

(481.) V. The 5th pair ariſe from the ſides of the annular proceſs, and after piercing the dura mater divide into three branches.

(482.) 1. The firſt of theſe is the OPHTHALMIC, which, as it is about to enter the orbit by the foramen lacerum, ſends off a ſmall cord that aſſiſts in the formation of the intercoſtal, and then the nerve is diſtributed into the glandula lacrymalis, fat, membranes, and palpebræ of the eye, while it ſends one conſiderable branch through the orbiter internus anterior hole, to be diſtributed through the membrana narium, and a ſecond paſſes the foramen and ſupercilia to ſupply the muſcles and teguments of the forehead. Hence we may account for the muſcles of reſpiration being ſo much affected on the application of any ſubſtance to the membrana narium, which provokes that violent convulſive motion, called ſneezing.

(483.) 2. The 2d branch of the fifth pair, which may be called *maxillaris ſuperior*, paſſes out through the foramen rotundum oſſis ſphenoidis, and immediately gives nerves to the fat under the crotaphite muſcle, and to the palate, ſome ſphenoidalis, and noſtrils. The remaining trunk inſinuating itſelf into the channel on the top of the antrum Highmorianum, to which cavity, and to the teeth of the upper jaw, it gives ſmall twigs, at laſt comes out at the orbiter external hole, and is ſpent on the muſculus orbicularis palpebrarum, noſe, and upper lip, where ſome branches of the ſeventh pair ſeem to unite themſelves to different portions of this.

(484.) 3. The 3d branch, or *maxillaris inferior*, goes out at the foramen ovale, and ſoon dividing into a great many branches, is diſtributed to the muſcles crotaphites, maſſeto, pterygoides, diaſtaticus, buccinator, mylohyoideus, geniohyoideus, genio-gloſſus and batio-gloſſus, glandula ſubmaxillaris, maxillaris inferior, and parotis; and laſtly, to the external ear, where it ſeems to join the portio dura to the ſubſtance of the tongue, in which it is pretty much confounded with the ninth pair. From the root of this laſt branch the *chorda tympani* is reflected. The laſt ramification of this branch which we ſhall mention, is that which enters into the canal of the upper jaw, furniſhes the teeth there, and comes out at the chin, on which and the lower lip it is beſtowed; at this place it is again conjoined to the ſeventh pair.

(485.) VI. The 6th pair of nerves, ariſing from the fore part of the corpora pyramidalia, after piercing through the dura mater, give off a branch, which, joined with the reflected portion of the ophthalmic branch of the 5th pair, forms the original of the *intercoſtal*, paſſes through the foramen lacerum to be ſpent entirely on the muſculus abductor oculi.

(486.) VII. The 7th pair iſſues out from the ſide of the root of the annular proceſs, and entering the meatus auditorius internus, and immediately dividing, one part ſoon loſes its firm coats, and is expended on the inmoſt camera of the ear, while the other, paſſing through the aquæductus Fallopii, comes out of the ſkull involved in all its coats between the ſtyloide and maſtoide proceſſes. Hence we ſee the reaſon of the firſt being named PORTIO MOLLIS, and the PORTIO DURA.

(487.) This laſt, after its exit, ſupplies the muſculi obliqui capitis ſtylohyoidei, ſtylo-gloſſi, and ſtylo-pharyngæi, and platyſma-myoides, on which, and to the ſkin of the neck, a great number of its ſmall filaments run, which are ſometimes cut in opening the jugular vein, whence ariſe pain at firſt, and a little numbneſs afterwards. The ſuperior branches of it ſupply the parotid gland, external ear, and whole ſide of the face, as far forwards as the chin. It is ſaid to communicate thrice with the fifth pair, and twice with the ſecond vertebra.

(488.) VIII. The 8th pair of nerves derive their origin from the ſide of the baſis of the corpora olivaria, where their looſe filamentous texture is very conſpicuous; then running to the hole common to the oſſa temporum and occipitis, they are there joined by the ACCESSORIUS WILLISII, which has its beginning from the 2 or 3 ſuperior nerves of the medulla ſpinalis, and mounts upwards thither, to paſs out with the 8th pair, at that common foramen juſt now mentioned. Very ſoon after, the acceſſorius ſeparates from its companion, and after paſſing through the middle of the muſculus maſtoideus, is loſt in the muſculus trapezius and rhomboides ſcapulæ.

(489.) 1. The large trunk, which, from the great number of branches it ſends off, obtains the name of VAGUS, or PAR VAGUM, runs ſtraight down the neck, near the carotid artery, in its courſe giving ſeveral branches to the larynx. After entering the thorax, it ſplits into two portions, the anterior of which ſerves the pericardium, ſends branches to join with thoſe of the intercoſtal that go to the heart, and then on the right ſide turns round the ſubclavian, and on the left, round the ductus arterioſus, to mount again upwards at the ſide of the œſophagus and be loſt in the larynx. This RECURRENT branch we are cautioned to avoid in bronchotomy.

(490.) 2. The poſterior branch of the 8th pair goes along with the œſophagus, and ſupplies the lungs, the gula, and ſtomach, very plentifully; and as all the nerves beſtowed on this viſcus enter at its ſuperior orifice, the ſenſation here muſt be very acute, whence Van Helmont imagined the oriſice of the ſtomach to be the ſeat of the ſoul! What remains of this par vagum is adjoined to the intercoſtal, immediately below the diaphragm.

(491.) IX. The 9th pair appears firſt at the inferior part of the corpora pyramidalia, paſs out at their proper holes of the occipitis, and after ſending off ſome nerves to the glandula thyroidea, and muſculi ſterno-hyoidei, and ſterno-thyroidei, are loſt in the ſubſtance of the tongue. Authors have diſputed whether this ninth, or the fifth is the guſtatory nerve.

(492.) X. The 10th pair proceeds from the beginning of the medulla ſpinalis, between the os occipitis and firſt vertebra colli, and is all, except what goes to the ganglion of the intercoſtal, ſpent on the muſculi obliqui, and extenſores capitis.

(493.) The only nerves proceeding from the encephalon, not deſcribed, are the reflected branches of the 5th and 6th, which indeed are ſo ſmall and pappy, and hid by the carotid artery, as they go out with it, in its crooked canal, as not to be eaſily traced; but when they have left the os petroſum, they are joined by branches from the 8th, 9th, and 10th pairs, and the 1ſt and 2d ſpinal; and the largeſt ganglion of the body is formed, from which the nerve, now named INTERCOSTAL, goes out and deſcends down the neck with the carotid, ſupplying in its courſe the flexor muſcles of the head and neck, and communicating with the cervical nerves. As the intercoſtal nerve is about to enter the thorax, it again forms a ganglion, from which the nerves to the trachea and the heart are ſupplied, which join with the branches of the 8th, and paſs between the two large arteries and auricles to the ſubſtance of that muſcle.

(494.) The INTERCOSTAL NERVE after this runs down on the ſide of the vertebræ of the cheſt, having additional nerves conſtantly ſent to it from between theſe vertebræ, till it paſſes through its own proper opening through the diaphragm; whence it again forms another ganglion, cloſe by the glandulæ renales, into which the 8th pair enters. From a ſimilar knot on each ſide, the nerves of the inteſtines, liver, ſpleen, pancreas, and kidneys, are derived; nay the extremity of this nerve is ſent down into the pelvis to ſupply the parts contained in it. Hence their ſtrong ſympathy with each other may be eaſily imagined, and a reaſon may be given for the violent vomiting that commonly attends the nephritic paroxyſms, and for the colic and ſtomachachs, which often precede obſtructions of the menſes in women.

(495.) Before we proceed to the SPINAL NERVES, we ſhall point out the order in which the nerves already deſcribed are to be diſſected, in order to demonſtrate them all in one ſubject; but to them we muſt annex the three firſt cervical nerves, for a reaſon which will hereafter be evident.—Portio dura ſeptimi, frontalis quinti, facialis quinti, mentalis quinti, ſpinalis ſecundus, ſpinalis primus, olfactorius, ophthalmicus quinti, motorius oculi, partheticus ſextus, opticus, maxillaris inferior quinti, maxillaris ſuperior quinti, acceſſorius Willifii, nonus, decimus, octavus, intercoſtalis, portio mollis ſeptimi.

(496.) The thirty pair of nerves proceeding from the medulla ſpinalis are generally divided into four ſpecies; viz. of the neck 7, of the back 12, of the loins 5, and of the os ſacrum 6. As the medulla ſpinalis has none of thoſe inequalities ſo obſervable on the medulla oblongata, the riſe of the nerves is not ſo accurately deſcribed, being only determined by the bones through which they paſs.

(497.) The FIRST CERVICAL nerve goes out between the firſt and ſecond vertebra, and, after ſending off the branches that communicate with the tenth and ſecond vertebral, is ſpent on the muſculus flexus colli, ſplenius, complexus, and teguments of the occiput.

(498.) The SECOND CERVICAL communicates with the 9th, and with the firſt and third of the neck, and then is diſtributed to the teguments of the neck and ſide of the head, and to the glandula parotis and external ear, where it joins with the portio dura.

(499.) The THIRD CERVICAL paſſes out between the 3d and 4th vertebra, ſoon communicating with the ſecond, and ſending down a large branch, which being joined by another from the 4th, forms the phrenic nerve, and runs along the pericardium, and is loſt in the diaphragm. In this courſe the right phrenic makes a ſmall turn round that part of the pericardium, which covers the apex of the heart. The other branches of this third cervical are diſtributed to the muſculus trapezius and deltoides, and to the teguments on the top of the ſhoulder; which, with the deſcription of the 8th pair, leads us evidently to the cauſe of Hippocrates's obſervation, that an inflammation of the liver is generally attended with a hiccough; and a ſuppuration of that viſcus, with a violent pain on the top of the ſhoulder.

(500.) The FOURTH CERVICAL NERVE, after ſending off that branch which joins with the 3d to form the phrenic, runs ſtraight to the axilla, where it meets with the 5th, 6th, and 7th cervicals, and firſt dorſal. All theſe ſink in the interſtices of the muſculi ſcaleni; and all of them are ſo often conjoined and blended, after they have given off nerves to the muſcles of the neck, ſcapula, arm, and thorax, and to the teguments, that when the ſeveral ramifications go off in the axilla to the different parts of the ſuperior extremity, it is impoſſible to determine which of them the branches belong to. The conſiderable branches into which they are divided, are 6; and to theſe proper diſtinguiſhing names have been given, by which the young anatomiſt's memory will be aſſiſted.

(501.) I. The CUTANEUS runs down the fore part of the arm, and ſerves the teguments, as far as the palm of the hand and fingers.

(502.) II. The MUSCULO-CUTANEUS, or *perforans caſſerii*, paſſes through the muſculus coracobrachialis, and after ſupplying the biceps and brachiæus internus is ſpent on the teguments of the back of the cubitus and hand.

(503.) III. The MUSCULARIS, which runs down the fore part of the arm to be loſt in the muſculi flexores carpi, digitorum, &c.

(504.) IV. The ULNARIS, which ſupplies the extenſores cubiti, and teguments of the elbow and then paſſing through the ſinuoſity at the back of the external condyle of the humerus, runs along the ulna, where it gives portions to the te-

gument

guments and neighbouring muſcles. At length it is loſt in the back of the hand, muſculi interoſſei, and lumbricales in the little finger, and ſide of the ring finger next to this. The courſe of this nerve is ſufficiently felt, when we lean on our elbow, by the inſenſibility or prickling pain that occur in the parts to which it is diſtributed.

(505.) V. The RADIALIS goes down the forepart of the arm, near the radius, beſtowing branches in its progreſs on the circumjacent muſcles; then dividing at the ligamentum annulare carpi it is ſent to the thumb, fore finger, middle finger, and half the ring finger, and to the back of the hand.

(506.) VI. The ARTICULARIS runs almoſt round the top of the os humeri, and ſerves the muſculi extenſores, cubiti retractores, and elevatores humeri.

(507.) The 12 dorſal nerves all communicate with one another. As ſoon as they make their way out between the vertebræ, each of them gives a poſterior branch to the muſculi erectores trunci corporis. The firſt, after having ſent off the brachial nerve, already deſcribed, is, after the ſame manner with the ſucceeding 8, beſtowed on the pectoral and intercoſtal muſcles. The 10th and 11th are moſt of them ſent to the abdominal muſcles. The 12th communicates with the firſt lumbar, and is beſtowed on the muſculus quadratus lumbalis and iliacus internus. See Plate VIII. fig. 1.

(508.) The 5th lumbar alſo communicates and gives poſterior branches. The firſt ſends ſeveral branches to the abdominal muſcles, pſoas, and iliacus, while others go from it to the teguments and muſcles on the ſuperior and anterior part of the thigh; and the main trunk of it is loſt in the crural. The 2d paſſes through the pſoas muſcle, and is diſtributed much as the former. The 3d is loſt in the muſculus pectineus.

(509.) Branches proceeding from the 1ſt, 2d, and 3d, make up one trunk, which runs along the anterior part of the pelvis, and ſlipping thro' a ſmall ſinuoſity in the anterior part of the foramen magnum iſchii, is ſpent in the muſculus triceps. This nerve is commonly known by the name of *obturator*, or *poſterior crural* nerve.

(510.) By the union of branches, from the 1ſt, 2d, 3d, and 4th lumbar nerves, the anterior crural nerve is formed, which running along the pſoas muſcle, eſcapes with the large blood-veſſels out of the abdomen below the tendinous arcade of the muſcles, and is diſtributed to the muſcles and teguments on the fore part of the thigh. One branch of this crural nerve accompanies the vena ſaphena as far as the ancle.

(511.) The remainder of the 3d and 4th lumbar nerves join with the 1ſt, 2d, and 3d that proceed from the os ſacrum. Theſe 5, when united, conſtitute the largeſt nerve of the body, ſo well known by the name of the *ſciatic*, or *iſchiatic nerve*, which ſeems to be bigger, in proportion to the part for the uſe of which it is deſigned, than the nerves of any other part are. The intention of this may be to afford ſufficient ſtrength to the muſcles of the lower extremity, for exerting a force ſuperior to what is required in any other part of the body. Hence the functions of this nerve are in any way impeded, we know how difficult it is to ſupport ourſelves to walk. The ſciatic nerve goes out at the great hollow behind the great tubercle of the os iſchium, and paſſing over the quadrigemini muſcles, runs down the poſterior part of the thigh, giving off, every where as it goes, nerves to the teguments and muſcles of the thigh and leg.

(512.) At the ham, the ſciatic nerve divides into 2; the ſmaller part mounts over the fibula, and ſerving the muſculi peronei flexores pedis, and extenſores digitorum, is continued to the toes along the broad of the foot, while the larger trunk ſinks under the muſculi gemelli, and then divides. One part of this diviſion is ſpent in the muſcles at the back of the leg and teguments, while the other is continued by the inner ancle to the foot. Theſe then ſubdivide; one branch of each ſubdiviſion is diſtributed after the ſame manner as the ulnaris, and the other as the radialis in the hand. The other nerves, that come out of the os ſacrum, are ſent to the organs of generation, muſculi levatores ani, and obturatores.

SECT. IV. *Of the* VIS NERVEA.

(513.) ANATOMISTS univerſally agree, that to the nerves we owe all *ſenſation* and *motion*, of which they are the proper organs; and the ſenſations in the minuteſt parts being very diſtinct, the inſtruments of ſuch ſenſations muſt have diſtinct origins directed to each part. Though all are agreed as to the effect, yet anatomiſts have hitherto vainly endeavoured to inveſtigate the cauſe, and ſhew how it is produced. Some have contended, that ſenſation and motion are occaſioned by a *vibration* communicated to the nerves, which they ſuppoſed entirely ſolid and tenſe in their ſtructure; whilſt others accounted for it, by ſuppoſing the exiſtence of a ſimple fluid which was moved in them, and to which they gave the name of *animal ſpirits*.

(514.) A later, and much more probable hypotheſis, than either of theſe, has ariſen from the diſcovery of a ſpecies of electricity peculiar to animal bodies, and concerning which very intereſting accounts have been lately given by Galvini and others. Theſe, though ſufficiently deciſive to render nugatory all that has before been advanced on this difficult and almoſt inſcrutable topic, are yet far from affording a ſatisfactory ſolution of the phenomena of nervous influence. It may not be amiſs, however, to relate what are the prevailing opinions concerning the influence of the nerves in producing muſcular motion.

(515.) The exiſtence of a VIS INSITA in the muſcles, different from a *vis nervea* having been advanced by Dr HALLER in his *Elementa Phyſiologiæ*, (ſee Part II Sect. I. § 190.) this doctrine has been called in queſtion by ſeveral, particularly by Dr MONRO who urges the following ſtrong objections to it, in his Obſervations on the Nervous Syſtem:

(516.) "The chief experiment," ſays the Dr, "which ſeems to have led Dr Haller to this opinion, is the well-known one, that the heart and other muſcles, after being detached from the brain, continue to act ſpontaneouſly, or by ſtimuli may be rouſed into action for a conſiderable length of time; and when it cannot be alledged, ſays Dr Haller

Haller, that the nervous fluid is by the mind, or otherwiſe, impelled into the muſcle.

(517.) "That in this inſtance, we cannot comprehend by what power the nervous fluid or energy can be put in motion, muſt perhaps be granted; but has Dr Haller given a better explanation of the manner, in which his ſuppoſed vis inſita becomes active?—If it be as difficult to point out the cauſe of the action of the *vis inſita*, as that of the action of the *vis nervea*, the admiſſion of that new power, inſtead of relieving, would add to our perplexity. We ſhould then have admitted, that two cauſes of a different nature were capable of producing exactly the ſame effect; which is not in general agreeable to the laws of nature.

(518.) "We ſhould find other conſequences ariſe from ſuch an hypotheſis, which tend to weaken the credulity of it. For inſtance, if in a ſound animal the vis nervea alone produces the contraction of the muſcles, we will aſk what purpoſe the vis inſita ſerves? If both operate, are we to ſuppoſe that the vis nervea, impelled by the mind or living principle, gives the order, which the vis inſita executes, and that the nerves are the internuntii; and ſo admit two wiſe agents employed in every the moſt ſimple action? But inſtead of ſpeculating farther, let us learn the effect of experiments, and endeavour from theſe to draw plain concluſions.

(519.) "I. When I poured a ſolution of opium in water under the ſkin of the leg of a frog, the muſcles, to the ſurface of which it was applied, were very ſoon deprived of the power of contraction. In like manner when I poured this ſolution into the cavity of the heart, by opening the vena cava, the heart was almoſt inſtantly deprived of its power of motion, whether the experiment was performed on it fixed in its place, or cut out of the body.

(520.) "II. I opened the thorax of a living frog; and then tied or cut its aorta, ſo as to put a ſtop to the circulation of its blood. I then opened the vena cava, and poured the ſolution of opium into the heart; and found not only that this organ was inſtantly deprived of its powers of action, but that in a few minutes the moſt diſtant muſcles of the limbs were extremely weakened. Yet this weakneſs was not owing to the want of circulation, for the frog could jump about for more than an hour after the heart was cut out. In the firſt of theſe two experiments, we obſerve the ſuppoſed vis inſita deſtroyed by the opium; in the latter, the vis nervea; for it is evident that the limbs were affected by the ſympathy of the brain, and of the nervous ſyſtem in general, with the nerves of the heart.

(521.) "III. When the nerve of any muſcle is firſt divided by a tranſverſe ſection, and then burnt with a hot iron, or punctured with a needle, the muſcle in which it terminates contracts violently, exactly in the ſame manner as when the irritation is applied to the fibres of the muſcle. But when the hot iron or needle is confined to the nerve, Dr Haller himſelf muſt have admitted, that the vis nervea, and not the vis inſita, was excited. But here I would aſk two queſtions.

(522.) "Firſt, Whether we do not as well underſtand, how the vis nervea is excited when irritation is applied to the muſcle, as when it is applied to the trunk of the nerve, the impelling power of the mind ſeeming to be equally wanting in both caſes?

(523.) "Secondly, If it appears that irritation applied to the trunk of a nerve excites the vis nervea, why ſhould we doubt that it can equally well excite it, when applied to the ſmall and very ſenſible branches and terminations of the nerve in the muſcle?

(524.) "As, therefore, it appears that the ſuppoſed vis inſita is deſtroyed or excited by the ſame means as the vis nervea; nay, that when, by the application of opium to the heart of a frog, after the aorta is cut and the circulation is interrupted, we have deſtroyed the vis inſita, the vis nervea is ſo much extinguiſhed, that the animal cannot act with the diſtant muſcles of the limb; and that theſe afterwards grow very torpid, or loſe much of their ſuppoſed vis inſita; it ſeems clearly to follow, that there is no juſt ground for ſuppoſing that any other principle produces the contraction of a muſcle."

(525.) The VIS NERVOSA, or operation of the mind, if we may ſo call it, by which a muſcle is brought into contraction, is not inherent in the muſcle like the *vis inſita*, neither is it perpetual, like this latter property. After long continued or violent exerciſe, for example, the voluntary muſcles become painful, and at length incapable of further action; whereas the heart and other involuntary muſcles, the motions of which depend ſolely on the *vis inſita*, continue through life in a conſtant ſtate of action, without any inconvenience or waſte of this inherent principle.

(526.) In a word, the action of the vis nervoſa on the voluntary muſcles conſtitutes what is called muſcular motion; a ſubject that has given riſe to a variety of hypotheſes, many of them ingenious, but none of them ſatisfactory.

(527.) EXPLANATION of PLATE VIII.

FIG. 1. A VIEW *of the* HEART *and* BLOOD VESSELS.

1. The right ventricle of the heart of a fœtus injected with wax. 4. The right auricle. 3. The left auricle. 4. Branches of the pulmonary veins of the right lobe of the lungs, thoſe of the left being cut off ſhort. 5. The arteries of the left lobe of the lungs. 6. The vena cava deſcendens. 7. Aorta aſcendens. 8. Arteria pulmonalis. 9. Ductus arterioſus.

FIG. 2. ANOTHER VIEW *of the* BLOOD VESSELS.

10. The umbilical vein. 11. Branches of the vena portarum in the liver. 12. Ductus venoſus. 13. Branches of the cava in the liver. 14. Vena cava.

FIG. 3. *The* INSIDE *of the* ARM *diſſected, to ſhew the* COURSE *of the* VEINS, ARTERY, *&c.*

1. Part of the biceps flexor cubiti. 2. The fascia tendinoſa from that muſcle, which is liable to be pricked in opening the baſilic vein. 3. The humeral artery, on each ſide of which is a large vein. 4. Vena cephalica. 5, Vena medina. 6. Vena baſilica.

FIG

FIG. 4. *The* TRUNK, *with a view of the* LYMPHATIC VESSELS *and the* DUCTUS THORACICUS.

1. THE neck. 2, 2. The two jugular veins. 3. The vena cava ſuperior. 4, 4, 4, 4. The ſubclavian veins. 5. The beginning of the aorta, pulled to the left ſide by a ligature, to ſhow the thoracic duct behind it. 7. The branches ariſing from the curvature of the aorta. 7, 7. The two carotid arteries. 8, 8. The firſt ribs. 9, 9. The trachea. 10, 10. The ſpine. 11, 11. The vena azygos. 12, 12. The deſcending aorta. 13. The coeliac artery, dividing into three branches. 14. The ſuperior meſenteric artery. 15. The right crus diaphragmatis. 16, 16. The two kidneys. 17. The right emulgent artery. 18, 18. The external iliac arteries. 26, 29. The muſculi pſoæ. 19. The internal iliac artery. 20. The cavity of the pelvis. 21, 21. The ſpine of the os ilium. 22, 22. The groins. 23. A lymphatic gland in the groin, into which lymphatic veſſels from the lower extremity are ſeen to enter. 24, 24. The lymphatic veſſels of the lower extremities paſſing under Poupart's ligament. 25, 25. A plexus of the lymphatic veſſels on each ſide of the pelvis. 26. The pſoas muſcle with lymphatic veſſels upon its inſide. 27. A plexus of lymphatics, which having paſſed over the brim of the pelvis at 25, having entered the cavity of the pelvis, and received the lymphatic veſſels belonging to the viſcera contained in that cavity, next aſcends, and paſſes behind the iliac artery to 29. 28. Some lymphatic veſſels of the left ſide paſſing over the upper part of the os ſacrum, to meet thoſe of the right ſide. 29. The right pſoas, with a large plexus of lymphatics on its inſide. 30, 30. The plexus on each ſide of the ſpine. 31. Spaces occupied by the lymphatic glands. 32. The trunk of the lacteals, on the under ſide of the ſuperior meſenteric artery. 33. The ſame dividing into two branches, one of which paſſes on each ſide of the aorta; that of the right ſide being ſeen to enter the thoracic duct at (34). 34. The thoracic duct beginning from the large lymphatics. 35. The duct paſſing under the lower part of the crus diaphragmatis, and under the right emulgent artery. 36. The thoracic duct penetrating the thorax. 37. Some lymphatic veſſels joining that duct in the thorax. 38. The thoracic duct paſſing under the curvature of the aorta to get to the left ſubclavian vein; the aorta being drawn aſide to ſhow the duct. 39. A plexus of lymphatic veſſels paſſing upon the trachea from the thyroide gland to the thoracic duct.

FIG. 5. NERVES.

1. THE deſcending intercoſtal nerve. 2. Nerves of the neck. 3. The brachial nerves. 4. A ganglion in the deſcending intercoſtal nerve. 5. Branches from the intercoſtal nerve to the viſcera. 6. A probe under ſome of the intercoſtal nerves, that paſs out between the ribs. 7. The anterior crural nerves.

FIG. 6. *A* REPRESENTATION *of the* UTERUS *and its* APPENDAGES.

1. THE ſide of the uterus next the gut. 2. The fallopian tubes. 3. The fimbriæ. 4. Ovaria. 5. The mouth of the uterus. 6. Ligamenta rotunda. 7. The inſide of the vagina. 8. The orifice of the meatus urinarius. 9. The glans clitoridis. 10. The external labia of the vagina. 11. The nymphæ, which are continued from the præputium clitoridis.

PART VIII. OF THE SENSES AND THEIR ORGANS.

SECT. I. *Of the* SENSES *in* GENERAL.

(528.) ALTHOUGH the SENSES, properly ſpeaking, are like the SOUL, *immaterial*, implying certain ſenſations excited in the mind by external objects, and in this reſpect not proper ſubjects of anatomy, yet, as not only their whole *objects*, but likewiſe all their ORGANS are material, and ſubject to the knife of the anatomiſt, they conſtitute a very proper, and indeed a moſt important branch of anatomical knowledge.

(529.) The number and names of the ſenſes are univerſally known. The latter are moſt commonly and we believe moſt juſtly expreſſed in the participle: *Feeling*, (improperly ſtiled by ſome anatomiſts, *the Touch*,) *Taſting*, *Smelling*, *Hearing*, and *Seeing*. Theſe five ſenſes comprehend our whole ſources of ſenſation and knowledge. Without them, the mind could have no ideas. Without even the two laſt, we ſhould be more ignorant than the brutes. But deprived of the whole, (if it were poſſible to ſuppoſe an organized body ſuch as we have deſcribed, ſo totally defective) we would be mere maſſes of uninformed matter, as inert and inſenſitive as plants or minerals.

(530.) Among the innumerable proofs, which the anatomiſt may draw from the preſent ſtate of our exiſtence, of an all-wiſe ſuperintending providence, who over-rules even the defects of our nature, we cannot help here remarking, that although many individuals want *one* of theſe avenues to knowledge, none that we have ever heard or read of, have been ſo unfortunate as to be born deficient of thoſe *two* moſt important ſenſes, *ſeeing* and *hearing*. Though it is eaſy to ſuppoſe ſuch a caſe poſſible, yet we believe an inſtance of it has not occurred ſince the creation. And indeed, if it were to happen, it is difficult to conceive how it would be poſſible, to convey a ſingle ſcientific idea to the mind of ſuch an unfortunate human being. Perſons deprived of the one of theſe ſenſes often make aſtoniſhing acquiſitions of knowledge by means of the other; but a human being, deprived of both from his birth, would have little more ſenſation than an oyſter.

SECT. II. *Of* FEELING.

(531.) THE ſenſe of FEELING has, by ſome anatomiſts, not only been improperly ſtiled the TOUCH, which is only a *partial exertion* of the ſenſe of feeling, but, upon what principle we know not, has been abſolutely reſtricted to the papillæ of the cutis: although nothing is more certain, than that this ſenſe is almoſt univerſally diffuſed throughout the whole body, both externally and internally. Some parts, indeed, have leſs ſenſibility than others, in proportion as they are ſupplied with many or few nerves. The lungs and the glands on this account have only an obſcure

ſcure degree of feeling: And other parts, ſuch as the bones, cartilages, epidermis, &c. we will admit, have none. From the experiments made by Baron Haller, it even appears, that the ligaments, tendons, dura and pia mater, pericardium and perioſteum, which were formerly ſuppoſed to be highly ſenſible, are void of ſenſibility in a ſtate of health. But all this is owing to their having no nerves. And even theſe in certain ſtages of diſeaſe, when by ſwellings, or otherwiſe, they affect the adjacent nerves, become highly ſenſible. In ſhort, the ramifications of the nerves are ſo univerſally diffuſed through the whole body, that the ſenſe of feeling, with a very few exceptions, extends more or leſs to every part of it, and might, therefore, be ſtiled, in compariſon of the other four, the UNIVERSAL SENSE. Indeed, if it were otherwiſe, amputations and other painful operations in ſurgery, might be performed with very little trouble to the patient.

(532.) Upon this general view of the ſenſe of feeling, as diffuſed through the whole ſyſtem, for obvious and uſeful purpoſes, it appears, like the other ſenſes, indeed, to be in general *paſſive*; as we cannot help feeling the impreſſion of an object that *touches* any part of our body, whether hard, ſoft, ſolid, fluid, ſharp, blunt, hot or cold, &c. But although it is in general a paſſive ſenſe, it is capable by an effort of the will, of making thoſe *active* exertions, which properly come under the denomination of TOUCH. This active power ſeems chiefly lodged in the hands, or rather in the fingers, which may be thus accounted for.

(533.) The papillæ of the fingers, or inſide of the hand, may, by the operations of the mind, become erect or elevated, and being then gently preſſed or rubbed againſt a tangible body, they receive an impreſſion, which is conveyed to the brain, and is what we call the TOUCH. By this exertion we perceive the different qualities of bodies. Humidity, ſoftneſs, hardneſs, figure, &c. are the reſult of examination by the touch, which likewiſe ſerves to correct the miſtakes of our other ſenſes, though it ſometimes errs itſelf. The rete mucoſum moderates the action of the object touched, and preſerves the ſoftneſs of the papillæ. The cuticle excludes the air from withering and deſtroying the ſkin; and qualifies the impreſſions of bodies, ſo that they may be only ſufficient to affect the touch, without cauſing pain.

(534.) The exterior properties of bodies, ſuch as their ſolidity, moiſture, inequality, ſmoothneſs, dryneſs, or fluidity, and likewiſe their degree of heat or cold, are all capable of making different impreſſions on the papillæ, and conſequently of exciting different ideas in the ſenſorium. But this organ, like all the other ſenſes, is not equally delicate in every ſubject; being in ſome much more exquiſite than in others. In perſons born blind, it is ſometimes ſo exquiſite, as in a conſiderable degree to ſupply the place of ſight. We have read of a French lady of the preſent age, born blind, who had acquired a degree of touch ſo incredibly delicate, as to be able to read a printed book merely by feeling the forms of the letters, from the impreſſion made by the types! Though we will not vouch for this fact, yet it is certain, that blind perſons often make wonderful acquiſitions, merely by the habitual uſe of the ſenſe of feeling, and repeated exertions of the touch.

SECT. III. *Of* TASTING.

(535.) THE ſenſe of TASTING, falls naturally to be conſidered after that of FEELING, as it is not only in ſome reſpects a *ſpecies* of it, but its principal organ, like thoſe of the other, is furniſhed with papillæ. The tongue, every body knows, is the chief organ of the TASTE; and, from certain experiments, it appears that this ſenſe is exerciſed by the tongue chiefly, although it is not confined to that member alone. For, on whatever part of the mouth, palate, or gums, we apply a ſapid body, we do not perceive the ſenſe of pain, but of taſte; and from ſome bodies, as arum, pepper, &c. the ſenſation produced will be ſtronger and more diſtinct in theſe parts, than any where elſe. That ſenſation which is ſometimes excited in the ſtomach, œſophagus, and fauces, by the regurgitation of the aliments, ſeems alſo to belong to the tongue, to which the ſapid vapours are ſent back, uncommonly acrid and penetrating; and even that which is ſometimes occaſioned in the ſtomach, œſophagus, and fauces, from a riſing of the aliments, ſeems alſo to be owing to the tongue, to which the taſteable vapours are conveyed.

(536.) The PAPILLÆ of the tongue, which are larger and ſofter than thoſe of the ſkin, and perpetually moiſt, perform the office of touch more exquiſitely than the ſmall and dry cutaneous papillæ. The papillæ of the tongue being raiſed a little protuberant to perform the office of taſte, are affected in a particular manner by ſalts diſſolved in water, or ſaliva, and applied againſt their tips or ſummits; which being diſtinguiſhed by the mind, and referred to certain claſſes, are called *taſtes*, either four, ſweet, acerb, bitter, ſaline, urinous, ſpirituous, aromatic, or pungent and acrid, inſipid, putrid, and others reſulting partly from pure ſalts, and in part from an intermixture of the ſubtile animal, or vegetable oils, variouſly compounding and changing each other.

(537.) It has been a queſtion whether the diverſity of the taſtes ariſes from the different figure which are natural to ſalts? And whether the cubical figure of ſea ſalt is the reaſon of its having a different taſte from the nitre that is priſmatical, or from other ſalts of a different form? We anſwer that this does not ſeem probable; for, even taſteleſs cryſtals have their particular configurations, and the taſte ariſing from very different ſalts, and differently qualified objects of this ſenſe, are too much like each other, and at the ſame time too inconſtant and changeable, to allow ſuch a theory for example in nitre. The mechanical reaſon therefore, of the diverſity of taſtes, ſeems to reſide in the intrinſic fabric of the elements of ſapid bodies, which do not fall under the ſcrutiny of our ſenſes.

(538.) The nature or diſpoſition of the covering with which the papillæ are clothed, together with that of the juices, and of the aliments lodged in the ſtomach, have a conſiderable ſhare in determining the ſenſe of taſte; inſomuch, that the ſame flavour does not equally pleaſe or affect the

organs in all ages alike, nor in perſon in all temperaments; not even in the ſame perſon at different times, and in different ſtates of health or diſeaſe. In general, whatever contains leſs ſalt than the ſaliva itſelf, ſeems inſipid.

(539.) It has been aſſerted, that the ſpirituous parts, more eſpecially of vegetables, either penetrate into the papillæ themſelves, or elſe are abſorbed by the adjacent villi of the tongue. And the ſpeedy reſtitution of the ſtrength by vinous or aromatic liquors, has been urged as a proof of this; as, it is argued, this reſtitution takes place even before they are received into the ſtomach. But this argument is not concluſive, as theſe phænomena can be much more ſatisfactorily accounted for, upon the principle of excitement, or by the operation of the vis nervea.

(540.) One obvious intention of this ſenſe, and of the great variety of taſtes ſuited to it, afforded by different kinds of aliment, doubtleſs is, that we may know and diſtinguiſh ſuch foods as are moſt ſalutary; for, in general, there is not any one kind of wholeſome aliment, that is of a diſagreeable taſte; nor are there any ill-taſted ſubſtances that are fit for our nouriſhment. By exception, indeed, the moſt wholeſome food becomes prejudicial. We are invited to take neceſſary food, as well by the pain called hunger, as by the pleaſure ariſing from the ſenſe of taſte.

(541.) The tongue is likewiſe one of the principal inſtruments of ſpeech, and of the articulation of the voice. It ſerves alſo to collect all the morſels which we chew; to turn them in different manners and to different parts of the mouth; and to rub off whatever ſticks to the palate; and is uſeful in ſpitting, ſucking, &c. It bears a great part in deglutition, being aſſiſted by the diſtinct muſcles; which, by contracting, at the ſame time that the other muſcles preſs the lower jaw againſt the upper, raiſe the os hyoides, and keep it at a convenient height; that the ſtylo-gloſſi and hyo-gloſſi may make the baſis of the tongue move back upon the morſel which is to be ſwallowed, and force it into the pharynx, the parts of which, that are at that time immediately above the morſel, inſtantly contract, and puſh it into the œſophagus.

SECT. IV. *Of* SMELLING.

(542.) THE ſenſe of SMELLING has alſo been aſſerted by ſome fanciful theoriſts, who would allow us to have only *three* ſenſes, as a ſpecies of ſight. But all the *five* are ſufficiently diſtinct in their objects, as well as in their organs, to juſtify the uſual arrangement. As the taſting noxious food might in ſome inſtances be highly dangerous, we are enabled by ſmelling alone, to diſcover the noxious quality of aliments, eſpecially ſuch as are putrid, and conſequently peculiarly hurtful to the human frame; and at the ſame time that it directs us to avoid what is dangerous, it teaches us to diſcern what is grateful and wholeſome. This uſe of ſmelling, in chooſing food, is more obſervable in brutes than in men; yet men in a ſtate of nature, and who are undebauched by variety of ſcents, poſſeſs this ſagacious faculty in a very eminent degree. The powers and virtues of medicinal plants are hardly to be better known, that by the ſimple teſtimony of taſting and ſmelling. Hence, it is, that in all animals theſe organs are placed together; and hence the ſmelling is ſtronger, and the organs larger, in thoſe animals which have to ſeek their prey at a conſiderable diſtance, or to reject malignant plants from among thoſe that are fit for food.

(543.) The act of ſmelling is performed by means of a ſoft pulpy membrane, full of pores and ſmall veſſels, which lines the whole internal cavity of the noſtrils; it is thicker upon the ſeptum and principal convolutions, but thinner in the ſinuſes. Within this membrane are diſtributed veſſels and nerves which have been already deſcribed.

(544.) The NERVES of the noſe, being almoſt naked, require a defence from the air, which is continually drawn through the noſtrils, and blown out again by reſpiration. This part, which is the organ of ſmelling, is therefore ſupplied with a thick inſipid mucus, very fluid in its firſt ſeparation, but by the air condenſing into a thick, dry, and more conſiſtent cruſt. By this mucus the nerves are defended from drying and from pain. It is poured out from many ſmall arteries, and depoſited partly into numerous and cylindrical ducts, and partly into round viſible cryptæ or cells, ſcattered over all the noſtrils. It flows out all over the ſurface of the olfactory membrane, which is anointed with it on all ſides. This mucus is accumulated during night; but, in the day it either flows ſpontaneouſly, or may be more powerfully expelled by blowing the noſe. By becoming dry and harſh, it irritates the very ſenſible nerves of the membrane, when a ſneezing is excited for its removal.

(545.) The SINUSES of this part, which abound with mucus, are evacuated through apertures deſcribed, Part I. Sect. III. § 130. The tears deſcend, by a channel proper to themſelves, into the cavity of the noſe by which they moiſten and dilute the mucus. The cartilages render the noſe moveable by its proper muſcles, ſo as to be raiſed and dilated by a muſcle common to the upper lip, and to be contracted together into a narrow compaſs, by the proper depreſſor and compreſſor muſcle pulling down the ſeptum. Thus the prominent organ of ſmelling is adapted to the reception of ſcents; and it is dilated in proportion to the quantity of inhaled air, and again contracted, when the air is expelled in the ſame degree. The air, filled with the ſubtile and inviſible effluvia of bodies, conſiſting of their volatile, oily, and ſaline particles, is, by the powers of reſpiration, urged through the noſe, and applied to the almoſt naked, and conſtantly ſoft olfactory nerves, in which a kind of *feeling* is excited, which we call *ſmelling*; and by this ſenſe we diſtinguiſh ſeveral kinds of oils and ſalts, by different ſcents or odours, which are not eaſily reducible to claſſes, or recalled to memory. The odours, however, already eſtabliſhed, are ſufficient for our purpoſe.

(546.) This ſenſe ſerves to admoniſh us not only of pernicious putrefaction; but of violent acrimony; or of a mild and ſoapy quality in bodies. As ſalt, joined with an oil, is the object of taſte; and a volatile oil, added to ſalts, ſerves to excite ſmells, we may perceive the affinity of theſe two

ſenſes; which affinity ſeems to be the more neceſſary on account of theſe ſenſes mutually and jointly aſſiſting each other in performing their offices. Volatile particles are chiefly diſtinguiſhed by ſmell, and fixed ones by taſte; perhaps becauſe the thick mucus cuticle, ſpread over the tongue, intercepts the actions of the more ſubtle ſaline effluvia from acting upon the taſte, which yet eaſily affect the ſofter and leſs covered nerves of the internal noſe.

(547.) We know not the reaſon why ſome ſmells pleaſe, and others diſpleaſe; perhaps cuſtom may have ſome influence in this reſpect. The power of odours is ſtrong and quick, becauſe minute particles of matter are immediately applied to naked nerves ſituated very near the brain. Hence the force of poiſonous vapours, and hence alſo the quality certain odours poſſeſs, of recovering people from faintings, or after drowning. Hence alſo that violent ſneezing which often ariſes from acrid particles, and a diarrhœa from the ſmell of ſome medicines; hence the power of particular antipathies. Hence alſo the pernicious effects of exceſſive ſneezing, more eſpecially in producing blindneſs, which may, in ſome meaſure, alſo be more eaſily brought on by the conſent of the nerves, which are exceedingly numerous in the neighbouring organs. Among the various parts of the noſe, the ſeptum, and more eſpecially the os turbinatum, have a conſiderable ſhare in the organ of ſmelling, theſe parts being multiplied in quick-ſcented animals. In dogs and other quadrupeds, they are prodigiouſly lengthened, and beautifully formed into ſpiral laminæ: in fiſhes they are elegantly formed, like the teeth of a comb.

SECT. V. *Of* HEARING.

(548.) PREVIOUS to a deſcription of the manner, in which we are enabled to receive the impreſſions of ſound, it is proper to deſcribe the EAR, which is the ORGAN of HEARING. It is commonly diſtinguiſhed into *external* and *internal*. The former includes all that we are able to diſcover without diſſection, and the meatus auditorius, as far as the tympanum; and the latter, all the other parts of the ear.

(549.) The EXTERNAL EAR is compoſed of cartilage, (a ſubſtance beſt ſuited to preſerve its form, without being liable to break,) covered by the common integuments, and attached, by ligaments and muſcles, to the temporal bone. Although capable only of a very obſcure motion, it is found to have ſeveral muſcles. Different parts of it are diſtinguiſhed by different names; all its cartilaginous part is called *ala*, or *wing*, to diſtinguiſh it from the ſoft and pendent part below, called the *lobe*. Its outer circle or border is called *helix*, and the ſemicircle within this, *antihelix*. The moveable cartilage placed immediately before the meatus auditorius, which it may be made to cloſe exactly, is named *tragus*; and an eminence oppoſite to this at the extremity of the antihelix is called *antitragus*.

(550.) The CONCHA is a conſiderable cavity formed by the extremities of the helix and antihelix. The meatus auditorius, which at its opening is cartilaginous, is lined with a very thin membrane, which is a continuation of the cuticle from the ſurface of the ear. The uſe of the external ear is to collect ſounds, and direct them into the meatus auditorius, which is the paſſage that leads to the tympanum or drum. This paſſage is lined with a glandular membrane, in which alſo is ſome hair. The CERUMEN, or yellow WAX, which is ſecreted by theſe glands, is diffuſed over this membrane, and ſerves to defend it from the drying qualities of the air, and alſo to entangle any inſect that might otherwiſe get into the ear, and create much uneaſineſs. But indeed this ſeldom happens, as its bitterneſs generally prevents them. Sometimes this wax being ſeparated in too great quantity, fills up the paſſage and cauſes deafneſs; while, on the other hand, the ear is liable to great diſcharges of matter from the meatus auditorius. They are commonly called impoſthumes, but are probably nothing elſe than inflammation of the membrane we have deſcribed, and which cauſes an increaſed ſecretion from the glands.

(551.) At the farther extremity of the meatus auditorius lies the *membrana tympani*, which is extended upon a bony ridge almoſt circular. Its ſituation both in men and quadrupeds is nearly horizontal, inclined towards the meatus auditorius, which appears to be the beſt poſition for receiving ſounds; as they generally are reverberated from the earth. In men it is concave outwardly, but in birds it is convex, ſo as to place the upper ſide of it nearly perpendicular to the horizon, and render them more capable of hearing each other's ſounds when aloft in the air, where there can be but little reverberated ſound. This membrane does not entirely cloſe the paſſage, but has on one ſide a ſmall aperture covered with a valve. It has been found half open in perſons who in their life-time had not been deaf; and inſtances have been known, of men who could force the ſmoke of tobacco through their ears, in which caſe it could only go from the mouth through the euſtachian tube, and through the tympanum; yet in theſe inſtances the hearing was perfect. Experiments on animals indeed have proved that we may break the tympanum in both ears, and yet not deſtroy the hearing, and only with the temporary inconvenience of ſtrong ſounds being for ſome time heard with a degree of pain and uneaſineſs. Indeed there is a caſe upon record, in which the tympanum of a man was deſtroyed by an ulcer, and the auditory bones caſt out, and that without deſtroying the patient's hearing.

(552.) From theſe, and the like caſes, it may be concluded, that the membrana tympani, though uſeful in hearing, is not the ſeat of that ſenſe; and if any diſeaſe in that membrane ſhould obſtruct the paſſage of ſounds to the internal part of the ear, an artificial paſſage, through the membrane, might reſtore the ſenſe of hearing, as the removal of the opaque cryſtalline humour recovers ſight. Many years ago, a malefactor was pardoned on condition that he ſubmitted to the experiment; but he happened to fall ill of a fever which delayed the operation, and in the mean time there was ſo great a public clamour raiſed againſt it that the attempt was dropt.

(553.) This membrane in very young children is often covered with mucus; but whether this

is to be considered as a morbid appearance, or as neceſſary to prevent ſounds from affecting them too much, is uncertain. The father of four children born deaf was adviſed to lay bliſters upon the heads of the next children he might have, which he did to three that were born afterwards, and every one of them heard well. It ſeems not unreaſonable to ſuppoſe, that too great a quantity of this mucus upon the drum might be the cauſe of deafneſs in the four children; and that the diſcharge, made by the bliſters in the latter caſes, was the cauſe of their eſcaping the like evil.

(554.) Into the middle of the tympanum is extended a ſmall bone called MALLEUS, from its reſemblance to a hammer; whoſe oppoſite end is articulated to a bone called INCUS, from its likeneſs to an anvil; which latter bone is alſo articulated by the intervention of an exceeding ſmall one called *orbiculare* to a fourth bone called STAPES, or the *ſtirrup*, which it is very like. Theſe bones are contained in that cavity behind the tympanum, which is called the barrel of the ear; but ſome anatomiſts call the barrel only *tympanum*, and the membrane, *membrana* tympani. The malleus, being moved inward by the muſcles *obliquus internus*, or *trochlearis*, extends the tympanum that it may be more ſenſibly affected by the impulſe of ſounds, when they are too weak. This muſcle riſes from the cartilaginous part of the euſtachian tube, and paſſing from thence in a proper groove, it is reflected under a ſmall proceſs; and thence paſſes on, perpendicular to the tympanum, to be inſerted into the handle of the malleus, ſometimes with a double tendon.

(555.) Another extenſor of the tympanum, called OBLIQUUS EXTERNUS, lies parallel to this muſcle. It ariſes from the outer and upper part of the euſtachian tube, and paſſing through the ſame hole with the chorda tympani, which is a branch of the fifth pair of nerves, it is inſerted into a long proceſs of the malleus. This is not ſo obviouſly an extenſor as to be known to be ſo, without an experiment. The muſcle which relaxes this membrane is called externus tympani. It ariſes from the upper part of the auditory paſſage, under the membrane which lines that paſſage, and is inſerted into the upper proceſs of the malleus. The relaxation of the tympanum is made by this muſcle, without our knowledge, when ſounds are too ſtrong; and, as the pupil of the eye is contracted, when we have too much light, and dilated when there is too little, ſo, when ſounds are too low, or the ſenſe of hearing imperfect, the extenſors of the tympanum ſtretch it to make the impulſe of ſounds more effectual; juſt as in the caſe of a common drum, or the chords of any muſical inſtrument.

(556.) From the cavity behind the tympanum, which is called the barrel of the ear, goes the EUSTACHIAN TUBE, or *itur ad palatum*; it ends cartilaginous behind the palate. This paſſage ſeems to be exactly of the ſame uſe with the hole in the ſide of the common drum, that is, to let the air paſs in and out from the barrel of the ear to make the membrane vibrate the better; and perhaps, in the ear, which is cloſer than a common drum, to let air in or out as it alters in denſity; and if any fluid ſhould be ſeparated in the barrel of the ear, to give a paſſage to that alſo. This tube, when obſtructed, as ſometimes happens from the growth of a polypus behind the uvula, occaſions great difficulty of hearing.—Sometimes, on the other hand, when the meatus auditorius is obſtructed, a man, by opening his mouth wide, will hear well through this paſſage; which is often ſo open, that, on ſyringing water through the noſe, it paſſes into the barrel of the ear, and cauſes a temporary deafneſs. To try how far one can hear this way, it is only neceſſary to ſtop the ears, and take between the teeth the end of a wire, or chord, that will vibrate well, and holding the other end, ſtrike it, and the ſound that he hears, will be received through this paſſage.

(557.) The STAPES has a muſcle, called *muſculus ſtapedis*; it lies in a long channel, and ending in the ſtapes, ſerves to pull the ſtapes off the *feneſtra ovalis*; which, otherwiſe it covers. Beſides the feneſtra ovalis, there is near it another, ſomewhat ſmaller, called *rotunda*. Theſe two holes lead to a cavity, called *veſtibulum*, which opens into other cavities, aptly called *cochlea*, and three ſemicircular canals, altogether named the *labyrinth*; in which are ſpread the auditory nerves, to receive and convey the impulſe of ſounds to the brain. Beſides theſe, the *corda tympani*, which is a branch of the fifth pair of nerves, may alſo convey theſe ſenſations to the brain.

(558.) The two holes, called FENESTRA OVALIS, and ROTUNDA, are cloſed with a fine membrane, like that called the drum, and the larger, being occaſionally covered, and uncovered, by the ſtapes, cauſes ſound to be modulated, more or leſs, as beſt ſerves the purpoſes of hearing; and this advantage being added to that of a lax or tenſe tympanum, the effect of ſounds may be greatly increaſed or leſſened upon the auditory nerves, expanded in the labyrinth. In the loudeſt ſounds, the tympanum may be lax, and the feneſtra ovalis covered; and for the loweſt, the tympanum may be tenſe, and the feneſtra uncovered. If ſounds, propagated in the ear, were heard leſs, we might often be in danger before we were apprized of it; and if the organs of hearing were much more perfect, unleſs our underſtandings were ſo too, we ſhould commonly hear more things at once than we could attend to.

(559.) The SENSE OF HEARING, in producing which all the parts we have deſcribed aſſiſt, is occaſioned by a certain modulation of the air, collected by the funnel-like ſhape of the external ear, and conveyed through the meatus auditorius, to the membrana tympani. That ſound is propagated by means of the air, is very eaſily proved, by ringing a bell, under the receiver of an air-pump; the ſound it affords, being found to diminiſh gradually, as the air becomes exhauſted, till at length it ceaſes to be heard at all. Sound moves through the air, with infinite velocity; but the degree of its motion ſeems to depend on the ſtate of the air, as it conſtantly moves faſter in a denſe and dry, than it does in a moiſt and rarefied air. See ACOUSTICS.

(560.) That the air, vibrating on the membrana tympani, communicates its vibration to the

different parts of the labyrinth, and by means of the fluid contained in this cavity, affects the auditory nerve, so as to produce sound, seems to be very probable; but the situation, the minuteness, and the variety of the parts which compose the ear, do not permit much to be advanced, with certainty, concerning their mode of action. Some of these parts seem to constitute the immediate organ of hearing, and these are all the parts of the vestibulum: but there are others, which seem intended for the perfection of this sense, without being absolutely essential to it, as appears from the instances above mentioned.

(561.) Sound is more or less loud, in proportion to the strength of the vibration; and the variety of sounds seems to depend on the difference of this vibration; for, the more quick and frequent it is, the more acute will be the sound, and *vice versa*. Before we conclude this section, it will be proper to explain certain phænomena, which have a relation to the organ of hearing.

(562.) There are few people, who have not, in consequence of particular sounds, occasionally felt that disagreeable sensation, which is usually called *setting the teeth on edge*. The cause of this sensation may be traced, to the communication which the portio dura of the auditory nerve has, with the branches of the 5th pair, that are distributed to the teeth, being probably occasioned by the violent tremor, produced in the membrana tympani, by these very acute sounds. Upon the same principle, we may explain the strong idea of sound, which a person has, who holds a vibrating string between his teeth.

(563.) The humming, which is sometimes perceived in the ear, without any exterior cause, may be occasioned, either by an increased action of the arteries in the ear, or by convulsive contractions of the muscles of the malleus and stapes, affecting the auditory nerve in such a manner as to produce the idea of sound. Mr Elliot, in his Philosophical Observations on Hearing, says, that there are sounds liable to be excited in the ear, by irritation, and without any assistance from the vibrations of the air.

SECT. VI. *Of* SEEING.

(564.) THE organs of the sense of SEEING, are divided into two parts: viz. the INTERNAL, which is the globe or body of the eye; and the EXTERNAL, which comprehends all those parts, surrounding the globe, and subservient to it. The EYES are situated in two bony cavities, named ORBITS, where they are surrounded by several parts, which are either intended to protect them from external injury, or to assist in their motion. These orbits have all their vacant spaces filled with a loose fat, which serves as a proper socket for them to move or rest in.

(565.) The globe of the eye is immediately covered by two PALPEBRÆ, or eye-lids, which are composed of muscular fibres, covered by the common integuments, and lined by a very fine and smooth membrane, which is from thence extended over part of the globe of the eye, and is called *tunica conjunctiva*. Each eye-lid is cartilaginous at its edge; and this border, which is called *tarsus*, is furnished with a row of hairs, named CILIA, or *eye-lashes*.

(566.) The CILIA serve to protect the eyes from insects, and minute bodies floating in the air, and likewise to moderate the action of the rays of light, in their passage to the retina. At the roots of these hairs, there are sebaceous follicles, first noticed by Meibomius, which discharge a glutinous liniment. Sometimes the fluid they secrete has too much viscidity, and the eye-lids become glued to each other.

(567.) The upper border of the orbit is covered by the SUPERCILIA, or eye-brows, which, by means of their two muscles, are capable of being brought towards each other, or of being carried upwards. They have been considered as serving to protect the eyes, but they are probably intended more for ornament, than utility. It is observable, that the eye-brows are peculiar to the human species. The inner angle of each orbit, or that part of it which is near the nose, is called CANTHUS MAJOR, or the *great angle*; and the outer angle, which is on the opposite side of the eye, is the CANTHUS MINOR, or *little angle*.

(568.) In the upper and outer part of the orbit, is seated, the LACHRYMAL GLAND. Its use is to furnish a watery secretion, called the tears, which answer the end of washing off dust, and keeping the outer surface of the eye moist, without which, the transparent *cornea* would be less pellucid, and the rays of light disturbed in their passage to the retina; and that this liquor may be rightly disposed of, we are continually closing the eye-lids, to spread it equally, even when we are not conscious of doing so. At the inner corner of the eye, between the eye-lids, is a little reddish body, called *caruncula lachrymalis*, which seems placed there, to keep that corner of the eye-lids from being so totally closed, as to hinder the discharge of tears or gummy matter from the eye-lids, during sleep. Close to this caruncle, are situated, the *puncta lachrymalia*, which are little holes, one in each eye-lid, designed to carry off the superfluous tears into the *ductus ad nasum*.

(569.) The TUNICA CONJUNCTIVA is the first membrane of the eye. It covers so much of the eye, as is called the white, and being reflected all round, lines the two eye-lids. Being thus returned from the eye, to the inside of the lids, it effectually hinders any extraneous bodies from getting behind the eye, into the orbit, smooths the parts it covers, and thus renders the friction less between the eye and the eye-lids. This coat is very full of blood vessels, as appears when it happens to be attacked with inflammation.

(570.) The TUNICA SCLEROTICA, is every where white and opaque, and is joined, at its anterior edge, to another coat, which has more convexity, than any other part of the globe, and being exceedingly transparent, and somewhat like horn, is called CORNEA.—Some writers, who have given the name of *cornea* to all this outer coat, have named what is here and most commonly called *sclerotica*, *cornea opaca*; and its anterior and transparent portion *cornea lucida*. These two parts are perfectly different in their structure; so that some anatomists suppose them to be as distinct from each other

as the glaſs of a watch is, from the caſe into which it is fixed. The ſclerotica is of a compact fibrous ſtructure; the cornea, on the other hand, is compoſed of a great number of laminæ, united by cellular membranes. The ancients ſuppoſed the ſclerotica to be a continuation of the dura mater. Morgagni, and ſome other modern writers, are of the ſame opinion; but this point is diſputed by Winſlow, Haller, Zinn, and others.

(572.) Under the cornea lies the IRIS, which is an opake membrane, like the tunica choroides, but of different colours in different eyes, ſuch as blue, gray, black, or hazel; from which it is named *Iris*, after the goddeſs of the rainbow. The middle of the iris is perforated for the admiſſion of the rays of light and is called the *pupil*. Immediately under the iris lie the *proceſſes ciliares*. When the iris contracts, it dilates the pupil, and by that means ſuffers more rays of light to enter into the eye; whilſt the contrary is effected by the circular fibres of the iris acting from the circumference towards the centre. But theſe changes are not made with great quickneſs, as appears from the eyes retaining the painful effects of a ſtrong light, for ſome time after we come out of a dark place, and from our being unable at firſt to diſtinguiſh objects, on going ſuddenly from a light place to a dark one.

(573.) As the PUPIL always dilates in darker places, to receive more rays of light, ſo when any diſeaſe prevents the effect of thoſe rays, it dilates even in dark places to admit more light; this happens in the diſeaſe called *gutta ſerena*. In the human ſubject, the pupil is round, which enables us to ſee in every direction alike; it is alſo round in thoſe animals that are naturally the prey of other animals, both birds and beaſts. But quadrupeds of the gramnivorous kind have it horizontally oblong, by which they are fitted to view a large ſpace over the earth; while animals of the cat kind, who climb trees and prey indifferently on birds or animals that hide in the earth, have their pupils oblong the contrary way, by which they can look upwards and downwards at the ſame time.

(574.) The CHOROIDES lies immediately under the ſclerotis, and is a ſecond tunic or membrane very vaſcular, and of little firmneſs. It takes its name, indeed, from being furniſhed with a great number of veſſels. It has likewiſe been named *uvea*, on account of its reſemblance to a *grape*.—Many modern anatomical writers have conſidered it as a production of the pia mater. This was likewiſe the opinion of the ancients; but the ſtrength and thickneſs of the choroides, when compared with the delicate ſtructure of the pia mater, are ſufficient proofs of their being two diſtinct membranes.

(574.) Immediately below the tunica choroides, lies the third coat called the RETINA, which is an expanſion of the optic nerve, co-extended with the choroides. Rays of light ſtriking upon this membrane, the ſenſation is conveyed by the optic nerves, to the common ſenſorium. Theſe nerves do not enter at the middle of the bottom of the eyes, but nearer the noſe; for theſe rays of light being ineffectual for viſion that fall upon the entrance of the optic nerves, it is fit they ſhould ſo enter, as that the ſame object, or part of any object, ſhould not be unperceived in both eyes, which would have been the caſe, had they been otherwiſe inſerted; which appears from a common experiment of part of an object being loſt to one eye, when we are looking towards it with the other ſhut. In fiſh thoſe nerves ariſe diſtinct from the oppoſite ſides of the brain, and croſs without uniting; but as theſe animals have their eyes ſo placed, as not to ſee the ſame object with both eyes at once, whilſt thoſe animals, whoſe optic nerves ſeem to unite, *do* ſee the ſame object with both eyes at once, one would ſuſpect, that in the one they were joined to cauſe the object not to appear double, and that in the other they were kept diſtinct, to make the two eyes, which muſt view different objects at the ſame time, independent of each other.

(575.) Some, however, argue, that the ſeeing objects ſingle does not depend upon any ſuch union, nor even on the circumſtance of the ſight ſtriking upon correſponding fibres of the nerves, but upon a *judgement* derived from *actual experience*; all objects appearing ſingle to both eyes in the manner we are moſt uſed to obſerve them, but in other caſes double. For though we have a diſtinct image from each eye ſent to the brain, yet while both theſe images are of an object ſeen in one and the ſame place, we conceive of them as one; ſo when one image appears to the eyes of a ſquinting perſon in two different places, it gives the idea of two; and when two candles are ſeen in one place, as two candles rightly placed, through one hole in a board, they appear one.—This hypotheſis, however, is liable to inſurmountable objections, and appears to be contradicted by the experience of all mankind.

(576.) Between the tunica choroides and retina there is interpoſed a black powdery ſubſtance called *nigrum pigmentum*. With the origin of this, anatomiſts are as yet unacquainted, ſince no glandules can be diſcovered, which may be thought to yield it. The uſe chiefly aſſigned it, is that of abſorbing the rays of light as they paſs through the tranſparent net-work of the retina, ſo as to render viſion more accurate. In animals that graze this pigment is of a ſhining green colour.

(577.) On the under ſide of the iris and within the eye, we obſerve thoſe minute fibres above mentioned, called *ciliary proceſſes*, which paſs in radii or parallel lines from the circumference to the centre. The contraction and dilatation of the pupil are ſuppoſed to depend on the action of theſe proceſſes. Some have conſidered them as muſcular, but they are not of an irritable nature; others have ſuppoſed them to be filaments of nerves; but their real ſtructure has never yet been clearly aſcertained.

(578.) The inſide of the eye is filled with three humours, called *aqueous*, *cryſtalline*, and *vitreous*. The *aqueous humour* lies foremoſt, and ſeems chiefly of uſe to prevent the cryſtalline from being eaſily bruiſed by rubbing, or a blow; and perhaps it ſerves for the cryſtalline humour to move forward in, while we view near objects, and backward for remoter objects; without which mechaniſm, or, in the place of it, a greater convexity in the cryſtalline

talline humour in the former case, and a less convexity in the latter, it is difficult to imagine, according to the laws of optics, how we could so distinctly see objects at different distances.

(579.) It has been argued by some writers, that fish are able to draw their crystalline humour nearer to the bottom of the eye, when they are out of the water, and to throw it forwards when in the water; because the rays of light are less refracted in passing from water through the crystalline humour than from air. On the motions of this part in the subject indeed, a new opinion has been advanced by Mr Hunter, who, in the crystalline humour of the eye in many animals, but particularly in the cuttle fish, discovered a laminated and something like a muscular structure. By this kind of mechanism, it is supposed that instead of approaching or receding to accomodate itself to different distances, the crystalline possesses a power of augmenting or diminishing its convexity. But this doctrine wants confirmation.

(580.) Behind the aqueous humour lies the CRYSTALLINE. Its shape is that of a depressed spheroid; and it is distinctly contained in a very fine membrane or capsule called *aranea*. This humour being somewhat solid and of a convex form, has the effect of refracting the rays of light which pass through it; so that each pencil of rays from the same point of any object, may be united upon the retina, similar to what happens in a camera obscura. As transparent bodies refract the rays of light, not only in proportion to their convexity, but also in proportion to their different densities, whenever the crystalline humour is removed in the operation for the cataract, the aqueous possesses its place and becomes a lens; but that refracting light less than the crystalline, the patient needs a *convex* glass before he can see accurately.

(581.) In some eyes, either this humour being too convex or too distant from the retina, the rays unite too soon, unless the object is held very near to the eye; and this fault is remediable only by a glass of an oppofite sort, viz by a *concave* glass, as the contrary fault, common to old persons, is by a *convex* glass. Had the eye been formed for a nearer view, the object to be viewed would often obstruct the light; if, for a more distant view light enough would not commonly be produced from the object to the eye. In fish the crystalline humour forms a perfect sphere, which is necessary for them, because light being less refracted from water through the crystalline humour than from air, that defect is compensated by a more convex lens.

(582.) The VITREOUS HUMOUR is a gelatinous transparent body, which lies behind the crystalline, and fills up the greatest part of the globe of the eye. Its fore side is rendered concave by the impression of the crystalline, and its back side convex, in consequence of the globular shape of the organ. It serves as a medium to keep the crystalline humour and the retina at a due distance, and to transmit the rays of light which are reflected from external objects.

(583.) The eye receives its arteries from the internal carotid, through the foramina optica, and its veins pass through the foramina lacera, and empty themselves into the external jugulars. Besides the optic nerves which enter at the posterior part, the eye receives branches from the 3d, 4th, 5th, and 6th pair of nerves.

(584.) The humours of the eye, together with the cornea, are calculated to refract and converge the rays of light in such a manner as to form at the bottom of the eye a distinct image of the object we look at; and the point where these rays meet is called the *focus* of the eye. On the retina, as in a *camera obscura*, the object is painted in an inverted position; and it is only by habit that we are enabled to judge of its true situation, and likewise of its distance and magnitude.

(585.) This is the generally received philosophical doctrine upon the subject of optics; but it is a doctrine from which we cannot help expressing our dissent, because hypothesis is here not only unsupported by fact, but placed in *direct opposition* to it. In this, as well as in the former supposition, (§375.) that we could see objects *double*, did not experience, and judgment convince us, that they are single, we suspect too great a compliment is paid to *judgment* and *habit*. At what period of life, we would ask the supporters of these doctrines, does a child begin to exercise this degree of *judgement*, that they alledge is necessary to correct the mistakes of his sense of seeing? And what is the reason, if the doctrine be true, that none of us can recollect the time, when we really saw people walking with their feet uppermost, and every thing else turned upside down? As to our seeing objects double, because we have two organs of vision, and correcting the mistake by habit, it may as well be affirmed, that we hear every *sound* double, because we have *two ears*! Of this last hypothesis, which no philosopher has as yet ventured to broach, evidences might be brought from the well known fact of the reduplication of sounds by echoes, fully more decisive than any we have yet met with, in proof of the doctrine of *double* or *inverted vision*.

(586.) In short those who support this theory seem to draw a false conclusion from a philosophical fact; and in our opinion, to argue as absurdly, as an ignorant person would do, who knew nothing of printing, and who, upon being taken into a printing-office, and observing the types all set the backward way, should from thence conclude, that books were really printed in an *inverted* form, but that learned men, by *habit* and *experience*, had acquired the art of reading them the right way. In all probability it is as necessary to our seeing objects as they really are that the images of these objects be painted on the retina inverted, as it is necessary to print a book properly, that the types be previously set backward.

(587.) As for the anecdote related in proof of this doctrine, of the gentleman born blind, who was cured by Mr Cheselden, if it proves any thing, it only proves the sense of seeing to be a species of *feeling*. The supporters of these theories might as well quote the case of the blind man whom our Saviour cured, but who, before his cure was quite completed, "saw men as trees walking." The anecdote is as follows: "To a young gentlemen who was born blind, and who was

Fig. 1. Gall-Bladder &c.

Fig. 2. Arteries.

Fig. 3. Androg

Fig. 10. ARAC

Fig. 11.
ATINGA GUACU-MUCU.

Fig. 6. Argonauta Argo.

Fig. 8. ASTROLABE.

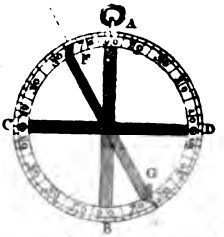

Fig. 5. Anguis Maculata.

Fig. 7. ARMILLARY SPHERE.

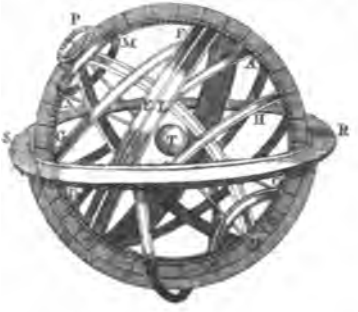

Fig. 4. ARACHNOI

Fig. 9. ATHANOR.

was couched by Mr Cheſelden, every object (as he expreſſed himſelf) ſeemed to *touch* his eyes, as what he felt did his ſkin; and he thought no objects ſo agreeable as thoſe which were ſmooth and regular, although for ſometime he could form no judgment of their ſhape, or gueſs what it was in any of them that gave him pleaſure."

(588.) Now, if this young gentleman, for ſome time after his cure, had actually ſeen objects *double* or *inverted*, or both, the anecdote would really have afforded a deciſive evidence of the truth of one or both of theſe hypotheſes; but as neither of theſe circumſtances took place, but only a ſenſation of agreeable *feeling*, (a ſimile very naturally drawn, by a man born blind, from the exerciſe of that ſenſe, which he had been hitherto moſt *habituated* to exert,) it appears perfectly evident that both theories are totally groundleſs, and quite unſupported by fact.

(589.) To paint objects diſtinctly on the retina, the cornea is required to have ſuch a degree of convexity, that the rays of light may be collected at a certain point, ſo as to terminate exactly on the retina.—If the cornea is too prominent, the rays, by diverging too ſoon, will be united before they reach the retina, as is the caſe with *myopes*, or near-ſighted people; and on the contrary, if it is not ſufficiently convex, the rays will not be perfectly united when they reach the back part of the eye; and this happens to long-ſighted people, who, in medical language, are called *preſbytæ*, or *old people*; as this circumſtance is found conſtantly to take palce as we approach to old age, when the eye gradually flattens. Theſe defects are only to be ſupplied by glaſſes. Thoſe who are ſhort-ſighted will find their viſion improved by concave glaſſes; and thoſe who are too long-ſighted will find equal advantage from uſing convex ones. On the whole, the medium between the ſhort and long ſight is the beſt, by which a perſon can ſee diſtinctly enough objects that are both near and remote; and of this kind we reckon an eye that is able to read diſtinctly at the diſtance of one foot. But to continue a good eye requires other conditions, ſuch as a perfect clearneſs of the humours; a due mobility of the eye itſelf, and its parts; a ſenſibility of the pupil, and a retina neither too prurient nor too callous.

(590.) Thus we have given a conciſe but comprehenſive account of the human body, with all its various organs; and we flatter ourſelves nothing material has been omitted. Thoſe, however, who wiſh to conſult more extenſive treatiſes on the ſubject, muſt be referred to thoſe eminent authors, who have been repeatedly mentioned in the courſe of this treatiſe, and particularly in our introduction.

(591.) EXPLANATION OF THE ANATOMICAL FIGURES IN PLATE IX.

FIG. 1. *A View of the Gall-bladder and its Ducts.*—1. The gall-bladder. 2. Ductus ſiſticus. 3. Ductus hepaticus. 4. Ductus pancreaticus. 5. The entrance of the ductus communis into the duodenum.

FIG. 2. *Arteries; with a View of the Ramifications of the Meſenterica Superior.*—1. Part of the deſcending aorta. 2. Arteria cœliaca. 3. Menſenterica ſuperior. 4. Emulgentes. 5. Spermaticæ. 6. Some of the branches of the meſenterica inferior that are beſtowed upon the inteſtines.

FIG. 3. *A Specimen of the* ANDROGYNES, *in an Hermaphrodite, whoſe ſhape was rather female than male, but who was too young to have female breaſts, or a beard like a male.*—1. The glans clitoridis. 2. Nymphæ. 3. Labia with tefticles in them, divaricated to ſhew the parts between. 4. The entrance into the vagina. 5. Furca virginis.

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ANATOMY, in chemiſtry, is uſed for the analyſis of mixt bodies. In this ſenſe the chemiſts ſometimes call their art *anatomia ſpagyrica*, ſpagyrical anatomy. Accordingly they ſpeak of the anatomy of vitriol, ſulphur, &c.

ANATOMY OF BRUTES. See COMPARATIVE ANATOMY.

ANATOMY OF PLANTS may be conſidered as a branch of comparative anatomy, otherwiſe called *dendroanatomy*. The parts of plants which come under anatomical conſideration are, the roots, wood, bark, pith, fruit, leaves, flowers, &c. The anatomy of vegetables is chiefly owing to the induſtry of Malpighi, and Dr Grew, though conſiderably promoted by Ruyſch, who by a peculiar method of injection, produced divers ſkeletons or ſyſtems of veſſels of fruit, leaves, and the like. Something of the ſame kind has alſo been done by Thummingius. Some make F. Fabri the father of this ſcience; and alledge that Malpighi took many of his diſcoveries from him. Dr Highmore in his book of Generation, Dr Sharrock on the propagation of plants, and Dr Hook in his Microphagia, have alſo given ſome obſervations tending this way, though only collaterally. See PLANTS.

ANATRIPSIS, [from ανα and τριβω, I wear,] in ancient medicine, denotes friction. The word is ſometimes written ſimply tripſis.

(1.)* ANATRON. *n. ſ.* The ſcum which ſwims upon the molten glaſs in the furnace, which, when taken off, melts in the air, and coagulates into common ſalt. It is likewiſe that ſalt which gathers upon the walls of vaults.

(2.) ANATRON, ſkimmed from glaſs, as above deſcribed, is the ſame with what others call *fel vitri*, or gall of glaſs.

(3.) ANATRON, or NATRON, a kind of native ſaltpetre, or nitre, found in Egypt. It is of a cineritious colour, and bitter taſte, approaching to ſal ammoniac. It is the produce of a huge lake, on the ſurface of which it is gathered, in form of a ſcum.

(4.) ANATRON is alſo a compound ſalt, made of quicklime, alum, vitriol, common ſalt, and nitre; uſed as a flux to promote the fuſion and purification of metals.

(5.) ANATRON is likewiſe uſed for the *terra ſaracenica*; of which there are ſeveral kinds, black, red, and blue.

ANATROPE, [ανατροπη, from ανατρεπω, *to ſubvert*;] a ſubverſion or relaxation of the ſtomach, attended with the loſs of appetite, vomiting, and nauſea.

ANATTOM, one of the New Hebrides Iſlands, in the South Sea. Lon. 170. 9. E. Lat. 20. 16. S.

ANAUDI, thoſe who are dumb. See next article.

ANAUDIA, among naturaliſts, denotes dumbneſs, or a want of the uſe of ſpeech. *Anaudia* is by ſome, made to differ from *aphonia*, as the former is owing to a defect of the nerves of the tongue, the latter to that of the nerves of the larynx. Infants and mutes are *anaudi*, αναυδοι, not *aphoni*, αφωνοι.

ANAVINGA, in botany, a tree of a middle ſize, that grows in Malabar in the Eaſt Indies, eſpecially about Cochin. It is an evergreen, and its fruits and berries are ripe in Auguſt. The juice of the berries drank, excites ſweat, cures malignant diſtempers, and keeps the body open. A decoction of the leaves in water makes a fit bath, for ſuch as are afflicted with pains in the joints.

ANAUMACHION, [from α, negative, ναυς, *a ſhip*, and μαχομαι, *I fight*.] in antiquity, the crime of refuſing to ſerve in the fleet.

ANAX, in ancient writers, denotes a hero, or demigod. The word ſeems formed of the Hebrew *anakim*, or *enakim*, which ſignifies the ſame. Some will have it originally to import giants, called alſo γηγενεις, *earth-born*. See ANAK. Cicero ſays, that the three eldeſt ſons of Jupiter, called Διοσκουροι, were alſo denominated *anaces*.

ANAXAGORAS, one of the moſt celebrated philoſophers of antiquity, was born at Clazomene in Ionia, about the 70th Olympiad. He gave up his patrimony, to be more at leiſure to ſtudy philoſophy; and placed himſelf under the care of Anaximenes, the Athenian. When about 20 years of age, he went to Athens, and entered upon the ſtudy of philoſophy, where he remained 30 years. After aſſuming the character of a public teacher of philoſophy, he roſe quickly to high eminence, and produced many famous ſcholars, among whom were Euripides, the tragedian, Pericles, the ſtateſman, and the renowned Socrates. Anaxagoras contented himſelf with ſerving the republic in his own ſtation, without interfering in the public affairs of ſtate, by inſtilling into the minds of the Athenian youth the principles of wiſdom; and likewiſe by his daily advice in the moſt important affairs, particularly in the caſe of Pericles. But neither the friendſhip of the famous Pericles, nor his own general diſintereſtedneſs of character, nor his great learning, could guard him from the ſhafts of perſecution. He was accuſed of impiety, and as the introducer of new opinions reſpecting the

the gods. His judges condemned him to death; but, through the influence of Pericles, the ſentence was changed to baniſhment. He took up his reſidence at Lampſacus, where he ſpent the remainder of his days, teaching philoſophy in the ſchool of his deceaſed maſter Anaximenes. He died here in the year 428 B. C. The inhabitants of Lampſacus, had honoured him much during his life, and continued their reſpect for him after his death. See next article. He is ſaid to have wrote upon the phenomena of nature. His principal tenets were, that,—All things were in the beginning confuſedly placed together, without motion; that the principle of things is at the ſame time one and multiplex, which he therefore called *homœmeries*, or ſimilar particles, deprived of life: That beſides this there exiſted from all eternity, another principle, an infinite and incorporeal ſpirit, who gave the particles a motion; that ſuch as were homogeneal united, and ſuch as were heterogeneal ſeparated: That in this manner, ſimilar things, being united to ſuch as were ſimilar, ſuch as had a circular motion produced heavenly bodies; the lighter particles aſcended; thoſe which were heavy deſcended; and the rocks of the earth, being drawn up by the force of the air, took fire, and became ſtars, beneath which the ſun and moon took their ſtations. Thus he did not conſider the ſtars as divinities. Neither did he doubt the immortality of the ſoul: for, being aſked upon his death-bed if he wiſhed to be carried back to his own country, "It is no matter," replied he, "for there is a *near cut to heav'n* from every place."

ANAXAGORIA, in antiquity, a feſtival obſerved in honour of Anaxagoras. The occaſion of its being inſtituted was this: Anaxagoras dying at Lampſacus, the magiſtrates of that city aſked him, whether he deſired any thing to be done for him? He replied, that on the anniverſary of his death the boys ſhould have leave to play.

ANAXANDRIDES, king of Sparta, commenced his reign about 550 B. C. He had two wives, which was uncommon among the Lacedemonians; by one he had a ſon, named Cleomenes, who ſucceeded him, and by the other three children, one of whom was the famous Leonidas.

ANAXANDRIDES, a comic poet of Rhodes, who flouriſhed in the reign of Philip king of Macedonia, and wrote 65 plays.

ANAXARCHUS, a philoſopher of Abdera, a follower of Democritus, and highly eſteemed by Alexander the Great. His end was equally tragical and heroic. Having fallen into the hands of the enemy; Nicocreon, tyrant of Cyprus, ordered him to be pounded alive in a mortar; whereupon he replied—"Beat as thou wilt on the *bag* of Anaxarchus, *himſelf* thou canſt not hurt." On this the tyrant ſaid he would cut out his tongue, whereupon the philoſopher bit it off, and ſpit it at him.

ANAXIMANDER, a famous Greek philoſopher, born at Miletus in the 42d Olympiad. He was the firſt who publicly taught philoſophy, and wrote upon philoſophical ſubjects. He carried his reſearches into nature very far for the time in which he lived. It is ſaid that he diſcovered the obliquity of the Zodiac, was the firſt who publiſhed a geographical table, invented the gnomon, and ſet up the firſt ſun-dial in an open place at Lacedæmon. He taught, that infinity of things was the principal and univerſal element; that this infinite always preſerved its unity, but that its parts underwent changes; that all things came from it; and that all were about to return unto it. According to all appearance, he meant, by this obſcure and indeterminate principle, the chaos of the other philoſophers. He aſſerted, that there are an infinity of worlds: that the ſtars are compoſed of air and fire, which are carried in their ſpheres, and that theſe ſpheres are gods; and that the earth is placed in the midſt of the univerſe, as in a common centre. He added, that infinite worlds were the product of infinity, and that corruption proceeded from ſeparation. Materialiſm is alſo aſcribed to him. See next article.

ANAXIMANDRIANS, the followers of Anaximander. They are alſo nominated *hylopatini*; and ſtood oppoſed to the anatomiſts. They were the moſt ancient ſect of philoſophical atheiſts; they allowed of nothing in nature but bodies. Theſe bodies they aſſerted, admit of qualities, which produce and deſtroy each other, in a circle without beginning or end.

ANAXIMENES, an eminent Greek philoſopher, born at Miletus, the friend, ſcholar, and ſucceſſor of Anaximander. He diffuſed ſome light upon the obſcurity of his maſter's ſyſtem. He made the firſt principle of things to conſiſt in the air, which he conſidered as infinite, and to which he aſcribed a perpetual motion. He aſſerted, that all things which proceeded from it, were definite and circumſcribed; and that this air, therefore, was God, ſince the divine power reſided in it and agitated it. Cold and moiſture, heat and motion, rendered it viſible, and dreſſed it in different forms, according to the different degrees of its condenſation. All the elements thus proceeded from heat and cold. The earth was, in his opinion, one continued flat ſurface.

ANAXIMENES, the ſon of Ariſtocles of Lampſacus, an orator, the diſciple of Diogenes the Cynic, and of Zoilus the railer againſt Homer. He was preceptor to Alexander of Macedon, and followed him to the wars. Alexander being incenſed againſt the people of Lampſacus, they ſent this philoſopher to intercede for them. Alexander, knowing the cauſe of his coming, ſwore that he would do the very reverſe of whatever he deſired of him. Anaximenes begged of him to burn Lampſacus and extirpate the inhabitants, or ſell them for ſlaves. Alexander unwilling to break his oath, and not able to elude this ſtratagem, pardoned the people of Lampſacus.

ANAZARBA, or ANAZARBUS, a town of Cilicia, on the river Pyramus, the birth place of Dioſcorides, and of the poet Oppian. It was afterwards called *Cæſarea*, in honour of Auguſtus or Tiberius. It was deſtroyed by a dreadful earthquake, in the year 525, along with ſeveral other important cities: but they were all repaired at a vaſt expence, by the emperor Juſtin; who was ſo much affected with their misfortune, that, putting

putting off his diadem and purple, he appeared for ſeveral days in ſackcloth.

ANAZARBEIS, or ANAZARBENI, } The inhabitants of Anazarba. See laſt article.

ANBAR, a town of Hindooſtan.

ANBERTKEND, [in the Eaſtern Language, literally, the *ciſtern of the waters of life*,] a celebrated book of the Brachmans, wherein the Indian philoſophy and religion are contained. It is divided into 50 *beths*, or diſcourſes, each of which conſiſts of ten chapters. It has been tranſlated from the original Indian, into Arabic, under the title of *Merat al Maani*, i. e. the marrow of intelligence.

ANBLATUM, in botany. See APHYLLON, It is alſo named by Linnæus LATHRÆA, &c.

* ANBURY. *n. ſ.* See AMBURY.

ANCA, or ANCUS, in middle age writers, the thigh or hind leg.

ANCARANO, a town of Italy, in the pope's dominions, and marq. of Ancona, ſituated 5 miles N. of Aſcoli, and 82 NE. of Rome. Lon. 13. 29. E. Lat. 42. 48. N.

ANCASTER, [Sax. from *an*, and *ceaſter*, a caſtle,] a town in Lincolnſhire, under a hill, 8 miles from Grantham, and 15 South of Lincoln. While the Romans ruled in South Britain, it was called *Crococalana*, and was ſituated on the Roman highway. In thoſe days it was very populous, and it ſtill abounds with remnants of antiquity. There are large ſtone quarries in its neighbourhood, and the rocks lie very near the ſurface. Lon. 30. 0. W. Lat. 52. 30. N.

ANCASTLE, a ſmall town in Oxfordſhire, on the borders of Berkſhire.

ANCENIS, a town of France, ſeated on the Loire, in the department of Lower Loire, 25 miles E. of Nantz. Lon. 1. 9. W. Lat. 47. 20. N.

(1.) * ANCESTOR. *n. ſ.* [*anceſtor*, Lat. *anceſtre*, Fr.] One from whom a perſon deſcends, either by the father or the mother. It is diſtinguiſhed by *predeceſſor*: which is not, like *anceſter*, a natural but civil denomination. An hereditary monarch ſucceeds to his *anceſtors*: an elective, to his *predeceſſors*.—

Obſcure! why, pr'ythee what am I? I know
My father, grandſire, and great grandſire too:
If farther I derive my pedigree,
I can but gueſs beyond the fourth degree.
The reſt of my forgotten *anceſtors*,
Were ſons of earth like him, or ſons of whores.
Dryden.

(2.) ANCESTORS, ANCIENT HONOURS PAID TO. Moſt nations have paid honours to their anceſtors. It was properly the departed ſouls of their forefathers, that the Romans worſhipped under the denominations of *lares*, *lemures*, and *houſehold gods*. Hence the ancient tombs were a kind of temples, or rather altars, wherein oblations were made by the kindred of the deceaſed.

(3.) ANCESTORS, MODERN HONOURS PAID TO. The Ruſſians have ſtill their anniverſary feaſts, in memory of their anceſtors, which they call *roditeli ſubot*, q. d. *kinſfolk's ſabbath*, wherein they make formal viſits to the dead in their graves, and carry them proviſions, eatables, and preſents, of divers other kinds. They interrogate them, with loud lamentable cries, What they are doing?—How they ſpend their time?—What it is they want? and the like. The Quojas, a people of Africa, offer ſacrifices of rice and wine to their anceſtors, before they undertake any conſiderable action. The anniverſaries of their deaths are always kept by their deaths with great ſolemnity. The king invokes the ſoul of his father and mother, to make trade flouriſh, and the chace ſucceed!

(4.) ANCESTORS, WORSHIP OF, AMONG THE CHINESE. The Chineſe ſeem to have diſtinguiſhed themſelves above all other nations, in the veneration they bear their anceſtors. By the laws of Confucius, part of the duty, which children owe their parents, conſiſts in worſhipping them when dead. This ſervice, which makes a conſiderable part of the religion of the Chineſe, is ſaid to have been inſtituted by the emperor Kun, the fifth in order, from the foundation of that ancient empire. The Chineſe have both a ſolemn and ordinary worſhip, which they pay their anceſtors. The former is held regularly twice a-year, viz. in ſpring and autumn, with much pomp. One, who was preſent at it, gives the following account of the ceremonies on that occaſion: The ſacrifices were made in a chapel, well adorned, where there were ſix altars, furniſhed with cenſers, tapers, and flowers. There were 3 miniſters, and behind them, 2 young acolites. The 3 former went, with a profound ſilence and frequent genuflexions, towards the five altars, pouring out wine; afterwards, they drew near to the ſixth, and, when they came to the foot of the altar, half bowed down, they ſaid their prayers, with a low voice. The miniſters then went to the altar; the officiating prieſt took up a veſſel full of wine, and drank; then lifted up the head of a deer or goat; after which, taking fire from the altar, they all lighted a bit of paper: and the miniſter of the ceremonies turning towards the people, ſaid with a high voice, that he gave them thanks in the name of their anceſtors, for having ſo well honoured them; and, in recompence, he promiſed them, on their part, a plentiful harveſt, a fruitful iſſue, good health, and long life, and all thoſe advantages that are moſt pleaſing to men. The Chineſe give their anceſtors another ſimpler and more private worſhip. To this end, they have, in their houſes, a niche or hollow place, where they put the names of their deceaſed fathers, and make prayers and offerings of perfumes and ſpices to them at certain times, with bowing, &c. They do the like at their tombs. The Jews, ſettled in China, are ſaid to worſhip their anceſtors, like the heathens, and with the ſame ceremonies, except, that they offer not ſwines fleſh. Near their ſynagogues they have a hall, or court of anceſtors, wherein are niches for Abraham, Iſaac, &c. The Jeſuits alſo conformed, and were permitted by their general, to conform to this, and many other ſuperſtitious cuſtoms of the Chineſe. There is one peculiarity of another kind, wherein the Chineſe ſhow their regard for their anceſtors; in proportion as any of their deſcendants are preferred to a higher degree or dignity, their dead anceſtors are

are, at the ſame time preferred and ennobled with them. The kings, Ven-Van, Veu-Van, and Cheu-Cum, who were deſcended from vaſſal kings, when they mounted the imperial throne, raiſed their anceſtors, from the vaſſal ſtate, wherein they had lived, to the dignity of emperors; ſo that the ſame honours were, for the future, rendered them, as if they had been emperors of China. The ſame example was followed by ſubſequent kings, and now obtains among the grandees and literati: all now worſhip their anceſtors, according to the rank which they themſelves hold in the world. If the ſon be a mandarin, and the father only a doctor, the latter is buried as a doctor, but ſacrificed to as a mandarin. The like holds in degradations, where the condition of the fathers is that of their ſons.

* ANCESTREL. *adj.* [from *anceſtor.*] Claimed from anceſtors; relating to anceſtors: a term of law.—Limitation in actions *anceſtrel*, was anciently ſo here in England. *Hale.*

* ANCESTRY. *n. ſ.* [from *anceſtor.*] 1. Lineage; a ſeries of anceſtors, or progenitors; the perſons who compoſe the lineage.—A tenacious adherence to the rights and liberties tranſmitted from a wiſe and virtuous *anceſtry*, public ſpirit, and a love of one's country, are the ſupport and ornaments of government. *Addiſon.* 2. The honour of deſcent; birth.—Title and *anceſtry* render a good man more illuſtrious, but an ill one more contemptible. *Addiſon.*

* ANCHENTRY. *n. ſ.* [from *ancient*, and therefore properly to be written *anciently.*] Antiquity of a family; ancient dignity: appearance or proof of antiquity.—Wooing, wedding, and repenting, is a Scotch jig, a meaſure and a cinque pace; the 1ſt ſuit is hot and haſty, like a Scotch jig, and full as fantaſtical; the wedding mannerly modeſt, as a meaſure full of ſtate and *anchentry*; and then comes repentance, and with his bad legs falls into the cinque pace faſter and faſter, till he ſinks into his grave. *Shakeſpeare.*

ANCHILOPS, [αγκυλη, *contraction*, and ωψ, *eye*;] in medicine, denotes an abſceſs, or collection of matter, between the great angle of the eye and the noſe. If ſuffered to remain too long, or unſkilfully managed, it degenerates, the ſtagnating humours corrupt, and an ulcer is produced.—When the tumor is broke, and the tears flow involuntarily, whilſt the os lacrymale is not carious, it is an *ægylops*; but when the ulcer is of a long ſtanding, deep, fetid, and the os lacramyle becomes carious, it is a *fiſtula.* The cure is by reſtriction and exciſion, tying it at the root on the glandula lacrymalis, and when ready, cutting it off. See SURGERY, INDEX.

ANCHIROMACHUS, in middle age writers, denotes a kind of veſſel, which on account of its nimble ſailing, was uſed for the conveyance of anchors, and other neceſſary utenſils of ſhips. It is alſo written *ancyromagus*, *angromagus*, *anquiromagus*, and *anguiromagus.*

ANCHISES, in fabulous hiſtory, a Trojan prince, the ſon of Capys, and deſcended from Dardanus. Venus made love to him in the form of a beautiful nymph; and bore to him Æneas, the hero of Virgil's Æneid.

(1.) * ANCHOR. *n. ſ.* [*anchora*, Lat. 1. A heavy iron, compoſed of a long ſhank, having a ring at one end to which the cable is faſtened and at the other, branching out into two arms or flooks, tending upwards, with barbs or edges on each ſide. Its uſe is to hold the ſhip, by being fixed to the ground.—

He ſaid, and wept; then ſpread his ſails before (ſhore:
The winds, and reach'd at length the Cumæan
Their *anchors* dropt, his crew the veſſels moor.
Dryden.

2. It is uſed, by a metaphor, for any thing which confers ſtability or ſecurity.—Which hope we have as an *anchor* of the ſoul, both ſure and ſtedfaſt, and which entereth into that within the veil. *Heb.* 3. The forms of ſpeech in which it is moſt, commonly uſed, are, to *caſt anchor*, to *lye* or *ride at anchor.*—The Turkiſh general, perceiving that the Rhodians would not be drawn forth to battle at ſea, withdrew his fleet, when *caſting anchor*, and landing his men, he burnt the corn. *Knolles.*

(2.) * ANCHOR. *n. ſ. Shakeſpeare* ſeems to have uſed this word for *anchoret*, or an abſtemious recluſe perſon.—

To deſperation turn my truſt and hope!
An *anchor's* cheer in priſon be my ſcope.
Shakeſpeare.

(3.) ANCHORS, ANCIENT, ACCOUNTS OF. The moſt ancient anchors are ſaid to have been of ſtone; and ſometimes of wood, to which a great quantity of lead was uſually fixed. In ſome places, baſkets full of ſtones, and ſacks filled with ſand were employed for the ſame uſe. All theſe were let down by cords into the ſea, and by their weight ſtayed the courſe of the ſhip. Afterwards they were compoſed of iron, and furniſhed with teeth which, being faſtened to the bottom of the ſea preſerved the veſſel immoveable; whence ὀδόντες and *dentes* are frequently taken for anchors, in the Greek and Latin poets. At firſt there was only one tooth, whence anchors were called τετρώνυμοι, but in a ſhort time the ſecond was added by Palamus, or Anacharſis, the Scythian philoſopher. The anchors with two teeth were called ἀμφίοδοι, or ἀμφίστομοι; and from ancient monuments appear to have been much the ſame with thoſe uſed in our days, only the tranſverſe piece of wood upon their handles (the ſtock) is wanting in all of them. Every ſhip had ſeveral anchors; one of which, ſurpaſſing all the reſt in bigneſs and ſtrength, was peculiarly termed ἄρα or *ſacra*, and was never uſed but in extreme danger; whence *ſacram anchoram ſolvere*, is proverbially applied to ſuch as are forced to their laſt refuge.

(4.) ANCHORS, DESCRIPTION OF MODERN. The anchors now made are contrived ſo as to ſink into the ground as ſoon as they reach it, and to hold a great ſtrain before they can be looſened or diſlodged from their ſtation. They are compoſed of a ſhank, a ſtock, a ring, and two arms with their flooks. The ſtock which is a long piece of timber fixed acroſs the ſhank, ſerves to guide the flooks in a direction perpendicular to the ſurface of the ground; ſo that one of them ſinks into it by its own weight as ſoon as it falls, and is ſtill preſerved ſteadily in that poſition by th

the ſtock, which, together with the ſhank, lies flat on the bottom. In this ſituation it muſt neceſſarily ſuſtain a great effort before it can be dragged through the earth horizontally. Indeed this can only be effected by the violence of the wind or tide, or both of them, ſometimes increaſed by the turbulence of the ſea, and acting upon the ſhip ſo as to ſtretch the cable to its utmoſt tenſion, which accordingly may diſlodge the anchor from its bed, eſpecially if the ground be ſoft and oozy, or rocky. When the anchor is thus diſplaced, it is ſaid in the ſea-phraſe, to *come home*. That the figure of this uſeful inſtrument may be more clearly underſtood, a repreſentation of it is given in plate V. N° 1. It conſiſts of a long maſſy beam of iron erected perpendicularly, *b*, at the lower end of which are two arms, *d e*. of equal thickneſs with the beam (uſually called the *ſhank*,) only that they taper towards the points, which are elevated above the horizontal plane at an angle of 30 degrees, or inclined at the ſhank at an angle of 60 degrees; on the upper part of each arm (in this poſition) is a flook or thick plate of iron, *g b*, commonly ſhaped like an iſoſceles triangle, whoſe baſe reaches inward to the middle of the arm. On the upper end of the ſhank is fixed the ſtock tranſverſely with the flooks; the ſtock is a long beam of oak, *f*, in two parts, ſtrongly bolted and hooped together with iron rings. See alſo N° 2. Cloſe about the ſtock is the ring *a*, to which the cable is faſtened, or *bent*: the ring is curiouſly covered with a number of pieces of ſhort rope, which are twiſted about it ſo as to form a very thick texture or covering called the *puddening*, and uſed to preſerve the cable from being fretted or chafed by the iron. Every ſhip, has or ought to have, 3 principal anchors, with a cable to each, viz. the beſt *maitreſſe-anchre*, (which is the *anchora ſacra* of the ancients); the beſt bower, *ſecond ancre*; and ſmall bower, *ancre d'affourche*, ſo called from their uſual ſituation on the ſhip's bows. There are beſides ſmaller anchors, for removing a ſhip from place to place in a harbour or river, where there may not be room or wind for ſailing; theſe are the ſtream-anchor, *ancre de toue*; the kedge and grappling, *grapin*: this laſt, however, is chiefly deſigned for boats.

5. ANCHORS, METHOD OF MAKING. The goodneſs of the anchor is a point of great importance. Great care is therefore to be taken, that the metal it is made of be neither too ſoft nor too brittle; the latter rendering it liable to break and the former to ſtraiten. The ſhank, arms, and flooks, are firſt forged ſeparately; then the hole is made at one end of the ſhank for the ring, which alſo being previouſly forged, is put into the hole of the ſhank, and the two ends ſhut together. After which the arms are ſhut to the ſhank, one after the other, and the anchor is finiſhed. Proof is made of anchors, by raiſing them to a great height, and then letting them fall again on a kind of iron block placed acroſs for the purpoſe. To try whether the flooks will turn to the bottom and take hold of the ground, they place the anchor on an even ſurface, with the end of one of the flooks, and one of the ends of the ſtock reſting on the ſurface; in caſe the anchor turns, and the point of the flook riſes upwards, the anchor is good. In England, France, and Holland, anchors are made of forged iron: but in Spain they are ſometimes made of copper, and likewiſe in ſeveral parts of the South Sea. Travellers tell us of people in the Indies who make uſe of wooden anchors in their navigation.—The inhabitants of the iſland of Ceylon, in lieu of anchors, uſe huge round ſtones; and, in other places, their anchors are a kind of machines of wood, loaden with ſtones. Sometimes bags of ſand have been made uſe of, but theſe chiefly obtained in rocky places, where anchors would not take hold.

(6.) ANCHORS, PROPORTIONS OF. For the the proportions of anchors, according to Manwaring, the ſhank ſhould be thrice the length of one of the flooks, and half the length of the beam. According to Aubin, the length of the anchor ſhould be four tenths of the greateſt breadth of the ſhip; ſo that the ſhank, *e. gr.* of an anchor in a veſſel 30 feet wide, is to be 12 feet long. When the ſhank is, for inſtance, 8 feet long, the two arms are to be 7 feet long, meaſuring them according to their curvity. As to the degree of curvity given the arm, there is no rule for it; the workmen are there left to their own diſcretion. The latter writer obſerves, that the anchor of a large heavy veſſel is ſmaller, in proportion, than that of a leſſer and lighter one. The reaſon he gives is, that though the ſea employs an equal force againſt a ſmall veſſel as againſt a great one, ſuppoſing the extent of wood upon which the water acts to be equal in both, yet the little veſſel, by reaſon of its ſuperior lightneſs, does not make ſo much reſiſtance as the greater; the defect whereof muſt be ſupplied by the weight of the anchor. From theſe, and other hydroſtatic principles, the following table has been formed; wherein, is ſhown, by means of the ſhip's breadth within, how many feet the beam or ſhank ought to be long, giving it for tenths or two fifths of the ſhip's breadth within: by which proportion might be regulated the length of the other parts of the anchor. In this table is repreſented likewiſe the weight an anchor ought to be for a ſhip, from eight feet broad to 45, increaſing by one foot's breadth; ſuppoſing that all anchors are ſimilar, or that their weights are as the cubes of the lengths of the ſhanks.

Breadth of the Veſſel. Feet.	Length of the Anchor. Feet.	Weight. Pounds.
8	3½	33
9	3¾	47
10	4	64
11	4¼	84
12	4½	110
13	5	140
14	5¼	175
15	6	216
16	6¼	262
17	6½	314
18	7	373
19	7½	439
20	8	512
21	8½	593
22	8¾	692

Breadth of the Veſſel. Feet.	Length of the Anchor. Feet.	Weight. Pounds.
23	9 1/4	778
24	9 1/2	884
25	10	1000
26	10 3/4	1124
27	10 3/4	1259
28	11 1/4	1405
29	11 1/2	1562
30	12	1728
31	12 1/4	1905
32	12 1/2	2097
33	13 1/4	2300
34	13 1/2	2515
35	14	2742
36	14 1/4	2986
37	14 3/4	3242
38	15 1/4	3512
39	15 1/2	3796
40	16	4096
41	16 1/4	4426
42	16 1/2	4742
43	17 1/4	5088
44	17 3/4	5451
45	18	5832

M. Bouguer, in his *Traite de Navire*, directs to take the length of the ſhank in inches, and to divide the cube of it by 1160 for the wieght. The reaſon is obvious; becauſe the quotient of the cube of 201 inches, which is the length of an anchor weighing 7000 lb. divided by the weight, is 1160; and therefore, by the rule of three, this will be a common diviſor for the cube of any length, and a ſingle operation will ſuffice. The ſame author gives the following dimenſions of the ſeveral parts of an anchor. The two arms generally form the arch of a circle, whoſe centre is three eighths of the ſhank from the vertex, or point where it is fixed to the ſhank; and each arm is equal to the ſame length, or the raidus; ſo that the two arms together make an arch of 120 degrees: the flooks are half the length of the arms, and their breadth two fifths of the ſaid length. With reſpect to the thickneſs, the circumference at the throat, or vertex of the ſhank, is generally made about the fifth part of its length, and the ſmall end two thirds of the throat; the ſmall end of the arms of the flooks, three fourths of the circumference of the ſhank at the throat. Theſe dimenſions ſhould be bigger, when the iron is of a bad quality, eſpecially if caſt iron is uſed inſtead of forged iron.

(7.) ANCHORS VARIOUS KINDS OF. There are 3 kinds of anchors commonly uſed; the *kedger*, the *grapnel*, and the *ſtream anchor*. The diſtinctions of anchors are taken from their uſe, and the proportion they bear in the ſhip, where they are employed; for that which in one ſhip would be called but a *kedger*, or *kedge anchor*, in a leſſer would be a *ſheet anchor*. 1. The kedge anchor is the ſmalleſt, which, by reaſon of its lightneſs, is firſt to ſtop the ſhip in kedging a river. This is what the Dutch ſailors call *sweep ancker*, the French *ancre a touer*. It ought to weigh 450 pounds. The *grapnel* is an anchor for a ſmall ſhip or boat. 2. The ſtream anchor, is a ſmall anchor faſtened to a ſtream cable, wherewith to ride in rivers, and gentle ſtreams, and to ſtop a tide with in fair weather. 3. The ſheet anchor is the biggeſt and ſtrongeſt, being that which the ſeamen call their laſt hope; never to be uſed but in great extremity. This is what the Romans called *anchora ſacra*; the Dutch *ſlegt anker*, and *ſtop anker*; the French *maitreſſe ancre*, or *grand ancre*.

(8.) ANCHORS, in architecture, are a ſort of carving, ſomewhat reſembling anchors. They are commonly placed as part of the enrichments of the boultins of capitals of the Tuſcan, Doric, and Ionic orders, and alſo of the boultins of bed-mouldings of the Doric, Ionic, and Corinthian cornices, anchors and eggs being carved alternately through the whole building.

(9.) ANCHORS, in heraldry, are emblems of hope, and are taken for ſuch in a ſpiritual as well as a temporal ſenſe.

ANCHOR, TO CLEAR THE, ſignifies the getting the cable off the flook. Generally alſo, when they let fall the anchor, they uſe this term, to ſee that neither the buoy-rope, nor any other ropes, hang about it.

ANCHOR, TO DRAG THE, is when the anchor gives way, or looſes its hold in the ground by the force of the wind or ſea, and the veſſel drives from the place.

ANCHOR, TO DROP THE, or CAST, imports the letting it down into the ſea. In ſome caſes it is neceſſary to drop two anchors oppoſite to each other, one of them to keep the ſhip firm againſt the tide, or flow, the other againſt the ebb.

ANCHOR, TO FISH THE, to draw up the flooks upon the ſhip's ſide after it is catted. See the articles DAVIT and FISH.

ANCHOR, TO RIDE AT, in the ſea language, the ſtate of a veſſel moored and fixed by her anchors at ſome proper ſtation. Where a great number of veſſels are moored in the ſame port, care is to be taken by the pilots, or thoſe who have the command, that each ſhip be at a due diſtance from the reſt, to prevent their running foul of each other; alſo that they be neither too near nor too far from land. The proper ſpace betwixt veſſels is, from two or three cable's length.

ANCHOR, TO SHOE THE, denotes putting boards on the flooks, in the form of flooks themſelves, to make it broader than before, uſed when they are obliged to anchor in bad ground to prevent the ſhip from driving. In ſome caſes they have to tallow the anchor, where the ground is too ſoft. The advantage of this ſeems to be, that the tallow ſinks deeper into the ooze, and thus the anchor finds harder ground at the bottom, to fix in.

ANCHOR, TO STEER THE SHIP TO HER, is to ſteer the ſhip's head towards the place where the anchor lies when they are heaving the cable into the ſhip; that the cable may thereby enter the hauſe with leſs reſiſtance, and the ſhip advance towards the anchor with great facility.

ANCHOR, TO WEIGH, imports the act of the drawing, or recovering the anchor into the veſſel, in

in order for ſailing. The anchor is ordinarily weighed, or recovered by means of a capſtan or windlaſs.

* *To* ANCHOR. *v. a.* 1. To place at anchor; as, he *anchored* his ſhip. 2. To fix on.—

My tongue ſhould to my ears not name my boys,
Till that my nails were *anchor'd* in thine eyes.
Shakeſpeare.

(1.) * ANCHORAGE. *n. ſ.* [from *anchor*.] 1. The hold of the anchor.—Let me reſolve whether there be indeed ſuch efficacy in nurture and firſt production; for if that ſuppoſal ſhould fail us, all our *anchorage* were looſe, and we ſhould but wander in a wild ſea. *Wotton.* 2. The ſet of anchors belonging to a ſhip.—

The bark that hath diſcharged her freight,
Returns with precious lading to the bay,
From whence at firſt ſhe weigh'd her *anchorage*.
Shakeſp.

3. The duty paid for liberty of anchoring in a port.

(2.) ANCHORAGE alſo ſignifies ground fit to hold a ſhip's anchor, ſo that ſhe may ride ſafely. The beſt ground for a ſhip to anchor in is ſtiff clay, or hard ſand; and the beſt riding at anchor is when a ſhip is land-locked, and out of the tide. See ANCHOR GROUND.

* ANCHORED. *participial adj.* [from *To anchor*.] Held by the anchor.—

Like a well-twiſted cable holding faſt
The *anchor'd* veſſel in the loudeſt blaſt. *Waller.*

ANCHORESS, a nun. *Bailey.*

* ANCHORET. } *n. ſ.* [contracted from *a-*
* ANCHORITE. } *nachoret*, ἀναχωρητης.] A recluſe; a hermit; one that retires to the more ſevere duties of religion.—His poetry indeed he took along with him; but he made that an *anchorite* as well as himſelf. *Spratt.*—You deſcribe ſo well your hermetical ſtate of life, that none of the ancient *anchorites* could go beyond you, for a cave in a rock, with a fine ſpring, or any of the accommodations that beſet a ſolitary life. *Pope.*

ANCHOR GROUND, is a bottom which is neither too deep, too ſhallow, nor rocky; as in the firſt the cable bears too nearly perpendicular, and is thereby apt to jerk the anchor out of the ground; in the ſecond, the ſhip's bottom is apt to ſtrike at low water, or when the ſea runs high, by which ſhe is expoſed to the danger of ſinking; and in the third, the anchor is liable to hook the broken and pointed ends of rocks, and tear away its flooks, whilſt the cable, from the ſame cauſe, is conſtantly in danger of being cut through as it rubs on their edges.

* ANCHOR-HOLD. *n. ſ.* [from *anchor* and *hold*.] The hold or faſtneſs of the anchor; and, figuratively, ſecurity.—The old Engliſh could expreſs moſt aptly all the conceits of the mind in their own tongue, without borrowing from any; as for example: the holy ſervice of God, which the Latins called *religion*, becauſe it knitted the minds of men together, and moſt people of Europe have borrowed the ſame from them, they called moſt ſignificantly *can-faſtneſs*, as the one and only aſſurance and faſt *anchor-hold* of our ſoul's health. *Camden.*

* ANCHOR-SMITH. *n. ſ.* [from *anchor* and *ſmith*.] The maker or forger of anchors.—Smithing comprehends all trades, which uſe either forge or file, from the *anchor-ſmith* to the watchmaker; they all working by the ſame rules, though not with equal exactneſs, and all uſing the ſame tools, though of ſeveral ſizes. *Moxon.*

* ANCHOVY. *n. ſ.* [from *anchova*, Span. or *anchioe*, Ital. of the ſame ſignification.] A little ſea fiſh, much uſed by way of ſauce, or ſeaſoning. Scaliger deſcribes the *anchovy* as of the herring kind, about the length of a finger, having a pointed ſnout, a wide mouth, no teeth, but gums as rough as a ſaw. Others make it a ſort of ſardine, or pilchard: but others, with better reaſon, hold it a peculiar ſpecies, very different from either. The fiſhing is chiefly in the night time; when a light being put on the ſtern of their little fiſhing veſſels, the *anchovies* flock round and are caught in nets. *Savary.*—We invent new ſauces and pickles, which reſemble the animal ferment in taſte and virtue, as the ſalſo-acid gravies of meat; the ſalt-pickles of fiſh, *anchovies*, oyſters. *Floyer.*

ANCHOVY, in ichthyology, is the Engliſh name of the clupea encraſicolus. See CLUPEA.

ANCHOVY PEAR. See GRIAS.

ANCHUSA, ALCANET or BUGLOSS: A genus of the monogynia order belonging to the pentandria claſs of plants; and in the natural method ranking under the 47ſt order, Aſperifoliæ, The calyx is a quinquepartite perianthium, oblong and perſiſtent: The corolla is monopetalous and funnel-ſhaped, the throat cloſed with ſcales: The ſtamina conſiſt of five ſhort filaments; the antheræ oblong and covered: The pericarpium has 4 germina, a filiform ſtylus, and obtuſe ſtigma: There is no pericarpium, the calyx containing the ſeeds in its boſom: The ſeeds are 4 oblong, gibbous, and engraven at the baſe. There are 8 ſpecies, all of which may be propagated by ſeeds. They ſhould be ſown, either in ſpring or autumn, upon a bed of light ſandy earth; and when the plants are ſtrong enough to be removed, they muſt be planted on beds at two feet diſtance from one another, and watered, if the ſeaſon requires it, till they have taken root; after which they will require no other care than to keep them free from weeds.

1. ANCHUSA ANGUSTIFOLIA, or perennial wild borage, grows to the height of two feet when cultivated in gardens; but in thoſe places where it grows wild is ſeldom more than a foot and an half high. The leaves of this ſort are narrow; the ſpikes of flowers come out double, and have no leaves about them; the flowers are ſmall, and of a red colour. The roots will continue two years in a poor ſoil.

2. ANCHUSA CRETICA, or warted bugloſs of Crete, is a low trailing annual plant, whoſe branches ſeldom extend more than ſix inches. The flowers are ſmall, of a bright blue colour, and are collected into ſmall bunches at the extremity of the branches. The plants periſh ſoon after their ſeeds are ripe.

3. ANCHUSA OFFICINALIS, or greater garden bugloſs, is a native of France and of the warmer parts of Europe, and thrives well enough in Britain; but the roots ſeldom continue longer than two years in this country, unleſs they grow in

rubbiſh, or out of an old wall, where they will live three or four years.

4. ANCHUSA ORIENTALIS, or eaſtern bugloſs, is a native of the Levant; but hardy enough to bear the open air in Britain, if it has a dry ſandy ſoil. It is a perennial plant, with long trailing branches which lie on the ground. The flowers are yellow, and about the ſize of the common bugloſs, and there is a ſucceſſion of theſe on the ſame plants great part of the year.

5. ANCHUSA SEMPERVIRENS, or ever-green borage, is a very hardy perennial plant, with weak trailing branches. It grows naturally in ſome parts of Britain and Spain. The flowers are blue, and come out between the leaves on the ſpike, like the laſt. They appear during a great part of the year.

6. ANCHUSA TINCTORIA, or true alkanet, grows naturally in the Levant, but is equally hardy with the officinalis, (§ 3.) The flowers grow in long ſpikes, coming out *imbricatim*, like the tiles of a houſe.

7. ANCHUSA VIRGINIANA, or puccoon, grows naturally in the woods of North America; and being an early plant, generally flowers before the new leaves come out on the trees; ſo that in ſome woods where it abounds, the ground ſeems entirely covered with its yellow flowers. It is a perennial plant, which ſometimes riſes a foot high in good ground, but not above half that height where the ſoil is poor. The flowers grow in looſe ſpikes upon ſmooth ſtalks.

8. ANCHUSA UNDULATA, or Portugal bugloſs, is a biennial plant, which grows to the height of two feet, and ſends out many lateral branches. The flowers are of a bright blue colour, and grow in an imbricated ſpike.

(9.) ANCHUSA, USES OF THE. The flowers of the officinalis have obtained the name of *cordial* flowers; to which they have no other title, than that they moderately cool and ſoften, without offending, the palate or ſtomach; and thus, in warm climates, or in hot diſeaſes, may in ſome meaſure refreſh the patient. The root of the tinctoria is likewiſe uſed, not as poſſeſſed of any medicinal virtue, but on account of its imparting an elegant red colour to oily ſubſtances; ſo is frequently directed as a colouring ingredient for ointments, plaſters, &c. As the colour is confined to the cortical part, the ſmall roots are to be preferred, as having proportionably more bark than the large ones. The alkanet root which grows in England is greatly inferior to what comes from abroad.

ANCHYLOBLEPHARON, or rather ANCYLOBLEPHARON, [from αγκυλος, bent, and βλεφαρον, the eye-lid,] a diſtemper of the eye-lids, wherein they ſometimes cohere to each other, and ſometimes to the globe of the eye itſelf. This is eaſily diſtinguiſhable from the ſlight glowing up of the eye-lids, occaſioned by the ſmall pox, or the like. This diſorder is ſometimes brought with an infant into the world; ſometimes it comes upon adults, by a fleſhy excreſcence from the angles of the eyes; and ſometimes it happens from accidents, as blowing up of gun-powder, the ſmall pox, &c. This is always dangerous, and difficult of cure, but moſt ſo, when the eye-lids grow to the cornea, which ſcarce ever admits of a cure. They are to be divided by a blunt pointed pair of ſciſſars, and it muſt then be tried, whether they adhere to the eye; and if they do, they muſt be ſeparated with great caution, with a blunt, pointed ſcalpel; for there is, in this caſe, great danger of injuring the ſight; after which, they muſt be kept from touching one another, to prevent their re-uniting, by lint dipt in a proper liniment, and by injections.

ANCHYLOPS. See ANCHILOPS.

ANCHYLOSIS. See ANCYLOSIS.

ANCI, [in Greek, γελιγωνιοι, *weak-elbowed*, from γελη, a *weakneſs*, and αγκων, an *elbow*,] an epithet uſed by Hippocrates, for thoſe, who, by the head of the *os humeri* ſlipping into the *ala*, have an arm ſhorter and ſmaller than it ought to be, and ſeemingly like the elbow of a weak; whence they are called by ſome *muſt-lani*, which fully expreſſes the Greek words. The diſorder that gives occaſion for the name, happens either in the womb, where the *os humeri* ſuffers a laxation, from too much moiſture; or in tender years, by means of an abſceſs, deeply ſeated about the head of the *os humeri*.

(1.) * ANCIENT. *adj.* [*ancien*, Fr. *antiquus*, Lat.] 1. Old; that happened long ſince; of old time; not modern. *Ancient* and *old* are diſtinguiſhed; *old* relates to the duration of the thing itſelf, as, an *old* coat, a coat much worn; and *ancient*, to time in general, as, an *ancient* dreſs, a habit uſed in former times. But this is not always obſerved; for we mention *old cuſtoms*; but though old be ſometimes oppoſed to *modern*, *ancient* is ſeldom oppoſed to *new*, but when it means *modern*.—*Ancient* tenure is that, whereby all the manours belonging to the crown, in St Edward's or William the Conqueror's day's, did hold. The number and names of which manours, as all others belonging to common perſons, he cauſed to be written in a book, after a ſurvey made of them, now remaining in the exchequer, and called Doomſday Book; and ſuch as by that book appeared to have belonged to the crown at that time, are called *ancient* demeſnes. *Cowel.* 2. Old; that has been of long duration.—With the *ancient* is wiſdom, and in length of days underſtanding. *Job.* xii. 12. Thales affirms, that God comprehended all things, and that God was of all things the moſt *ancient*, becauſe he never had any beginning. *Raleigh.*—

Induſtry
Gave the tall *ancient* foreſt to his axe. *Thomſon.*

3. Paſt; former.—

I ſee thy fury: if I longer ſtay,
We ſhall begin our *ancient* bickerings.
Shakeſpeare.

(2.) ANCIENT DEMESNE, TENANTS IN. In addition to Dr Johnſon's extract from Cowel, it is proper to mention, that the tenants in ancient demeſne, are of two ſorts; the one hold their lands frankly by charter; the other by copy of court-roll, or by the verge, at the will of the lord, according to the cuſtom of the manor. The advantages of this tenure are, 1. That tenants holding by charter, cannot be rightfully impleaded out of their manor; and, when they are, they may abate the writ, by pleading the tenure. 2. That

They are free from toil, for all things relating to their livelihood and husbandry; nor can be impannelled on any inquest. These tenants held originally by plowing the king's land, plashing his hedges, and the like service, for the maintenance of his household; and it was on this account that such liberties were given them, for which they may have writs of *monstraverunt* to such as take the duties of toll, &c. No lands are to be accounted ancient demesne, but such as are held in tage. Whether land be ancient demesne or not, must be tried by the book of Doomsday.

(3.) ANCIENT DIFFERENCES, in heraldry. See BORDURES.

(4.) * ANCIENT. *n. s.* [from *ancient, adj.*] 1. Those that lived in old time were called *ancients*, opposed to the moderns.—

And though the *ancients* thus their rules invade, [made;
As kings dispense with laws themselves have
Moderns, beware, or if you must offend
Against the precept, ne'er transgress its end. *Pope.*

2. Senior; not in use.—He toucheth it as a special pre-eminence of Junius and Andronicus, that in Christianity they were his *ancients*. *Hooker.*

(5.) * ANCIENT. *n. s.* 1. The flag or streamer of a ship, and, formerly, of a regiment. 2. The bearer of a flag, as was *ancient Pistol*; whence in present use, ensign.—

This is Othello's *ancient*, as I take it,
The same indeed, a very valiant fellow. *Shakes.*

(6.) ANCIENTS, in church history. See ELDERS.

(7.) ANCIENTS, in inns of courts, imports a distinction of a certain degree. Thus, the society of Gray's Inn consists of benchers, ancients, barristers, and students under the bar; here the ancients are the elder barristers. In the inns of Chancery, there are only ancients and students, or clerks; and among the ancients, one is yearly the principal, or treasurer. In the Middle Temple, ancients are such as are past their reading.

* ANCIENTLY. *adv.* [from *ancient.*] In old times.—Trebisond *anciently* pertained unto this crown; now unjustly possessed, and as unjustly abused, by those who have neither title to hold it, nor virtue to rule it. *Sydney.*—The colewort is not as enemy, though that were *anciently* received, to the vine only, but to any other plant, because it draweth strongly the fatest juice of the earth. *Bacon.*

* ANCIENTNESS. *n. s.* [from *ancient.*] Antiquity; existence from old times.—The Fescennine and Saturnian were the same; they were called Saturnian from their *ancientness*, when Saturn reigned in Italy. *Dryden.*

* ANCIENTRY. *n. s.* [from *ancient.*] The honour of ancient lineage; the dignity of birth.—Of all nations under heaven, the Spaniard is the most mingled, and most uncertain. Wherefore, most foolishly do the Irish think to ennoble themselves, by wresting their *ancientry* from the Spaniard, who is unable to derive himself from any in certain. *Spenser on Ireland.*—There is nothing in the between but getting wenches with child, wronging the *ancientry*, stealing, fighting. *Shakes.*

ANCIENTY, in some ancient statutes, is used for eldership, or seniority. The elder sister can demand no more than her other sisters, beside the chief mesne, by reason of her ancienty. This word is used in the statute of Ireland, 14 Hen. III.

ANCILLON, David, a minister of the reformed church at Metz, where he was born, in 1617. He studied from the 9th or 10th year of his age, in the Jesuits college, where he gave such proofs of his genius, that the heads of the society tried every means to draw him over to their religion and party; but he continued firm against their attacks. He went to Geneva in 1623, and studied divinity under Spanheim, Diodati, and Tronchin, who conceived a very great esteem for him. He left Geneva in 1641, and offering himself to the synod of Charenton, the whole assembly were so highly pleased with him, that they gave him the church of Meaux. Here he acquired a vast reputation for learning, eloquence, and virtue, and was even respected by those of the Roman Catholic communion. He returned to Metz in 1653, where he remained till the revocation of the edict of Nantes, in 1685. He then retired to Francfort, and having preached in the French church at Hanau, the whole congregation immediately called together the heads of the families, to invite him to be minister. The proposition being agreed to, about the end of 1685, he became so famous at Hanau, that the professors of divinity, and the German and Dutch ministers, and even the count of Hanau himself, came to hear Mr Ancillon. This occasioned a great jealousy in the two other ministers, which tending to make his situation uneasy, he went to Berlin; where he met with a kind reception from the elector, and was made minister of that metropolis; where his eldest son was made judge of the French, and his second son rewarded with a pension, and entertained at the university of Francfort upon the Oder.—His brother was also made judge of all the French in the states of Brandenburgh; and Mr Cayart his son-in-law, engineer to the elector. He died at Berlin in 1692, aged 75. Mr Ancillon having got a considerable portion by marriage, was enabled thereby to gratify his passion for books; his library was accordingly both curious and large, and he increased it every day, with all that appeared new and important in the republic of letters, so that at last it was one of the noblest collections in the hands of any private person in the kingdom. He published a book in quarto. in which the whole dispute concerning traditions is fully examined: he also wrote an apology for Luther, Zuinglius, Calvin, and Beza, and several other pieces.

ANCILLON, Charles, eldest son of the preceding, was born at Metz, in 1659. His merit raised him to the office of inspector of the French courts of justice at Berlin, and to the appointment of historiographer to the king of Prussia. He wrote several books against the revocation of the edict of Nantes, and other works. He died at Berlin in 1715.

ANCLABRIS, in the worship of the ancient Romans, denoted a table in temples, whereon the priests eat their portion of the sacrifices and oblations.

ANCLAM, a strong town of Western Pomerania,

rania, in Upper Saxony, ſeated on the Pene, 20 miles ſouth of Griſwald. Its ancient name was *Tunglim*, whence ſome have ſuppoſed it to have been the ſeat of that branch of Saxons, called by Tacitus, *Anglii*, ſome of whom emigrated, firſt to the banks of the Elbe, and afterwards to South Britain; to which they gave the name of *Anglia*, or *Angle-land*, afterwards gradually ſoftened into ENGLAND In later times, it made a figure among the Hanſe towns; being advantageouſly ſituated amidſt excellent paſture lands, and fertile corn fields; and the river Pene affording good opportunities of fiſhing, and exporting their produce.

* ANCLE. See ANKLE.

ANCLIFF, a ſmall town in Lancaſhire, two miles from Wigan. It has a hot ſpring, called the Burning Well.

ANCOATES, a village in Lancaſhire, a mile from Mancheſter.

ANCOBER, a territory on the gold coaſt of Guinea, ſo named from the river which runs thro' it. See next article.

ANCOBER, or RIO CORBF, a river of Africa, in the Gold Coaſt of Guinea, the banks of which afford an agreeable ſhade in that warm climate. There is a populous village on its weſtern bank.

ANCOME, a feſlon; a ſwelling that is hard and hot. *Bailey*.

(1.) ANCON, in anatomy, the curvation or flexure of the arm, whereon we reſt in leaning.—It is commonly called *olecranum*.

(2.) ANCON, in antiquity, was uſed by the Carthaginians, to denote a dark priſon or dungeon. Suidas mentions one of this kind, in which Gelimer uſed to put all who diſpleaſed him; from which Beliſarius delivered many merchants of the Eaſt, whom the tyrant intended to put to death.

(3.) ANCON, in architecture, is uſed to denote the corner or quoin of walls, croſs beams, or rafters. ANCONES, in the ancient architecture, denoted the two branches of a ſquare, which meet in an angle reſembling the letter L; as well as the brackets or ſhouldering pieces, called *conſoles*, and *corbells* by the moderns.

(4.) ANCON, in geography, applied to the angles or flexures of rivers; and ſometimes to the tops of mountains.

ANCONA, a province in the pope's territories in Italy. It lies between the gulph of Venice and mount Appenine, which bound it on the N. as do Abruzzo on the E. and the duchy of Spoletto, and that of Urbino, on the W. The air is indifferent; but the ſoil is fruitful, particularly in hemp and flax, and there is great plenty of wax and honey. It contains ſeveral large towns, particularly Fermo, Loretto, Recanati, Macerata, Jeſi, Tolentino, Aſcoli, Oſimo, St Severino, Monte Alto, Camerino, and Rapatranſone, which are all archiepiſcopal or epiſcopal ſees.

ANCONA, a ſea-port of Italy, the capital of the diſtrict of that name, and the ſee of a biſhop; ſituated 15 miles N. of Loretto, and 130 E. of Rome. It was formerly the fineſt port in all Italy, being built by the emperor Trajan, about the year 115; but was almoſt ruined, and its trade loſt; though it has again revived through the patronage of Clement XII. who made it a free port, and built a mole, for the ſecurity of the harbour, upon the ruins of the ancient mole. This mole is above 1000 feet in length, 160 in breadth, and 60 in depth below the ſurface of the ſea. Its harbour is the beſt in all the pope's dominions, and abounds with a peculiar ſpecies of ſhell fiſh, called *ballani*. The town lies round it on two hills, one of which is at the point of Cape St Syriaco from whence there is a delightful proſpect. On the other ſtands the citadel, which commands the town and harbour. The ſtreets are narrow and uneven; and the public and private buildings inferior to thoſe of the other great towns in Italy. The cathedral is a low dark ſtructure; and though the front is covered with fine marble, the architecture has neither beauty nor regularity. The churches of St Dominic, and the Franciſcans have each an excellent picture of Titian. The exchange where the merchants meet, is a handſome ſquare portico, in which is an equeſtrian ſtatue of Trajan. At the 4 corners are other 4 ſtatues. The triumphal arch of Trajan, which was built upon the mole, remains almoſt entire, with its inſcription. It is reckoned one of the moſt beautiful monuments of ancient Roman grandeur exiſting. The end of the mole is fortified with 10 or 12 pieces of canon. There are about 500 Jews in it, who reſide in a particular quarter of the city, and have a ſynagogue. The lower rank of people in this town are a little fantaſtical in their dreſs; but the higher, in general, follow the French mode. It is a great thoroughfare from the north of Italy to Loretto; which renders proviſions very dear. The tide does not riſe here above a foot, and near the Mediterranean it is ſcarce viſible. Lon. 15. 5. E. Lat. 43. 36. N.

ANCONÆUS MUSCULUS, in anatomy, the fixth muſcle of the elbow, ſo called, as being ſituate behind the ſolid of the *ancon*, or elbow.

ANCONES. See ANCON, N° 3.

(1.) * ANCONY. *n. ſ.* [in the iron mills.] A bloom wrought into the figure of a flat iron bar about 3 feet long, with a ſquare rough knobs, or at each end. *Chambers*.

(2.) ANCONY, WEIGHT AND MANUFACTURE OF. About 3 quarters of a cwt. is melted from a ſow of caſt iron; then hammered at the forge into a maſs of 2 feet long, and of a ſquare ſhape, called a *bloom*; this is ſent to the finery, where, after 2 or 3 heats, it is brought to the figure above mentioned, (§ 1.) and called an *ancony*. The middle part beat out at the finery, is about 3 feet long, and of the ſhape and thickneſs the whole is to be; this is ſent to the chafery, where the ends are wrought to the ſhape of the middle, and the whole made into a bar. See BAR.

ANCORARUM URBS, Ἀγκύρων Πόλις, a city in the Nomos Aphroditopolites, towards the Red Sea; ſo called becauſe there was in the neighbourhood a ſtone quarry, in which they hewed ſtone anchors, before iron anchors came to be uſed.

ANCOURT, Florent Carton, d', an eminent French actor and dramatic writer, born at Fontainbleau in 1661. He ſtudied in the Jeſuits college at Paris, under father de la Rue; who, diſcovering in him a remarkable capacity for learning, was extremely deſirous of engaging him in their order; but Ancourt's averſion to a religious life

ffe rendered all his efforts ineffectual. After he had gone through a courſe of philoſophy, he applied himſelf to the civil law, and was admitted advocate at 17 years of age. But falling in love with an actreſs, he married her, and turned to the ſtage, where he ſoon greatly diſtinguiſhed himſelf, not only as an actor, but as a dramatic author. His plays had ſuch prodigious ſucceſs, that moſt of the players grew rich from the profits of them. His merit procured him a favourable reception at courts; and Lewis XIV. ſhowed him many marks of his favour. His ſprightly converſation made his company agreeable to all the men of figure both at court and in the city. Having gone to Dunkirk, to ſee his daughter, he took the opportunity of paying his compliments to the elector of Bavaria, who was then at Bruſſels and received him with the utmoſt civility; and having detained him a conſiderable time, diſmiſſed him with a preſent of a diamond valued at 1000 piſtoles: he was likewiſe rewarded genteelly, when upon his coming to Paris, Ancourt compoſed an entertainment for him. Ancourt, at length quitted the theatre, in 1718, and retired to his eſtate of Courcelles le Roy, where he applied himſelf wholly to devotion, and compoſed a tranſlation of the Pſalms in verſe, and a ſacred tragedy, which were never printed. He died in 1726, aged 65. He wrote 52 plays in all, which, in the laſt edition make 9 volumes.

ANCRAFT, a village in Northumberland, near Belford.

(1.) ANCRE, a river of France, in the department of Somme.

(2.) ANCRE, a town of France, ſeated on and named after the river (1.); 12 miles SE. of Amiens, and 12 W. by N. of Perone. Lon. 2. 45. E. Lat. 49. 59. N.

ANCHREE, or ANCHORED, in heraldry, a form of croſs, ſo called, becauſe the four extremities reſemble the ſhook of an anchor.

(1.) ANCRUM, a pariſh, of Scotland, in the centre of the county of Roxburgh, extending (with Langnewton, which is united to it,) between 5 and 6 miles in length on the N. ſide of the Teviot, and about 4 in breadth. From the Statiſtical account of it, given into Sir J. Sinclair by Dr Somerville, we learn, that the ſoil in the lower grounds is in general rich and fertile; that the climate is good and promotes longevity; that a great proportion of the land is incloſed; that the pariſh, formerly bleak and barren, is now ornamented with ſeveral young thriving plantations on the grounds of Sir John Scott, Sir G. Douglas, and Admiral Elliot; that it is watered by the Ale, over which there are two ſtone bridges; that it abounds with good quarries of a durable ſpecies of free ſtone, that the valued rent is L. 12,332 2s. Scotch, and the real rent above L. 4000 Sterling; that the population in 1793, was 1146 ſouls, having increaſed 80 within theſe 50 years; and that the people in general are induſtrious and robuſt. In a note, the doctor mentions a heroic anecdote of an ancient Scotch Amazon, which ſhall be noticed in its proper place. See LILLIARD'S EDGE. To the honour of the heritors of Ancrum, they have voluntarily augmented the ſalary of the ſchool-maſter.

(2.) ANCRUM, a village in the pariſh of that name, ſeated on the S. ſide of the river Ale, where it runs in a curve; whence the original name Alncroms, which, in Gaelic, ſignifies *crook upon a river*.

(3.) ANCRUM HOUSE, the ſeat of the family of Scott of Ancrum, pleaſantly ſituated in the pariſh of that name, and beautifully ornamented with a number of oaks, elms, beeches, &c. which are reckoned the oldeſt trees in that part of the country.

(4.) ANCRUM MOOR, the ancient name of that memorable ſpot, which divides the pariſhes of Ancrum and Maxton, now called LILLIARD'S EDGE, which ſee.

ANCTERES, in the ancient medicine, ſeem to have been the ſame, at leaſt to have anſwered the ſame uſes, as our ſutures. Some alſo ſpeak of a ſtrong kind of ſticking plaſter under this denomination.

ANCTERIASMUS, in medicine, the operation of applying a *fibula* to cloſe the too patent lips of wounds. It is called by Latin writers *infibulatio*.

ANCUBITUS, among ancient phyſicians, denotes a diſeaſe of the eyes, wherein there is an appearance of ſand or little ſtones ſprinkled on them. It is alſo called petrification.

ANCUS, a name for ſuch as have an arm bent crooked, ſo that they cannot extend it.

ANCUS MARTIUS, the 4th king of Rome, ſucceeded Tullius Hoſtilius, A. A. C. 639. He defeated the Latins, ſubdued the Fidenates, conquered the Sabines, Volſcii, and Veientines, enlarged Rome by joining to it mount Janicula, and made the harbour of Oſtia. He died about A. A. C. 615.

ANCYLE, in antiquity, a ſmall brazen ſhield, ſaid to have fallen from heaven, in the reign of Numa Pompilius, at the time that a voice was heard, that Rome ſhould be miſtreſs of the world, while ſhe preſerved that ſhield! Though there was but one ancyle that fell from heaven, yet there were 12 preſerved; Numa, by the advice, as it is ſaid, of the goddeſs Egeria, having ordered 11 others, perfectly like the firſt, to be made by Veturius Mamurius, that if any ſhould attempt to ſteal it, as Ulyſſes did the Palladium, they might not be able to diſtinguiſh the true ancyle from the falſe ones. Theſe ancylia were preſerved in the temple of Mars; and committed to the care of 12 prieſts, inſtituted for that purpoſe. They were carried every year, in the month of March, in proceſſion all round Rome; and on the 30th of that month they were again depoſited in their place.

ANCYLE, in ſurgery. See ANCYLOSIS.

ANCYLOBLAPHARON. See ANCHYLOBLEPHARON.

ANCYLOGLOSSUM, [from αγκυλος, crooked and γλωσσα, the tongue;] a contraction of the ligaments of the tongue. Some have this imperfection from their birth, others from diſeaſe. In the firſt caſe, the membrane which ſupports the tongue is too ſhort or too hard: in the latter, an ulcer under the tongue, healing and forming a cicatrix, is ſometimes the cauſe. Mauriceau ſays, that the defect is occaſioned by a ſmall membranous production, which extends from the frænulum, to the top of the tongue, that hinders the child from ſucking, &c. He juſtly condemns the

cruel practice among nurſes, of tearing this membrane with their nails; for thus ulcers are ſometimes formed, which are of difficult cure: he adviſes to ſnip it with ſciſſars in two or three places, taking care not to extend the points of the ſciſſars as far as the Frænulum. The inſtances rarely occur which require any kind of aſſiſtance; for if the child can thruſt the tip of its tongue to the outer edge of its lip, this diſeaſe does not exiſt; and if the tongue is not greatly reſtrained, the frænulum will ſtretch by the child's ſucking and crying. It was formerly a common opinion of midwives, that none were born without this infirmity; and hence, one of the firſt things after a birth, was to cut the ſtring of the infant's tongue. Fabricius ab Aquapendente complains ſeverely of the officiouſneſs of midwives, who, without ever examining the condition of the *frænum*, practiſe the operation promiſcuouſly on all infants, from an opinion, that, without it, the child would never be able to ſpeak. But according to this author, there is ſcarcely one child among 100,000, in whom this ligament needs any cutting at all. In ſome parts of Italy, the midwives preſerve a long nail on their right thumb, faſhioned like a knife, wherewith, as ſoon as the child is born, they cut the ligament. In other places, the operation is performed with the edge of a piece of money. The operation is painful to the infant, and is ſometimes followed by inflammations, and even death itſelf.

ANCYLOGLOSUSS, one that is tongue-tied, or has an impediment in his ſpeech, ariſing from a contraction of the *frænum* of the tongue. The Ancylogloſſi, by nature, are late before they begin to ſpeak, but ſoon ſpeak properly, after they begin. See laſt article.

ANCYLOMELE, [αγκυλομηλη, from αγκυλος, crooked, and μηλη, a *probe*;] a ſurgeon's crooked probe, or probe with a hook.

ANCYLOSIS, [from αγκυλη, hardneſs or contraction,] in ſurgery, implies a diſtortion or ſtiffneſs of the joints, cauſed by a ſettlement of the humours, or a diſtenſion of the nerves, and therefore remedies of a mollifying and relaxing nature are required.

ANCYRA, the capital of Galatia, near the river Halys, ſaid to have been built by Midas, king of Phrygia, and named from an anchor found there. It was greatly improved by Auguſtus, deemed the ſecond founder of it, as appears from the Marmor Ancyranum. It is now called Angura, or Angoura. Lon. 33. E. Lat. 41. 20.

ANCYROIDES, αγκυροειδη, or *coracoydes*, in anatomy, the proceſs of the ſhoulder bones in form of a beak.

ANCYROPOLITES, the inhabitants of the city of ANCORÆ.

ANCYSTRUM, in botany: A genus of the digynia order, belonging to the diandria claſs of plants; the eſſential characters of which are: The calyx is a ſingle leaved, four toothed perianthium, four-awn'd, the awns terminated with croſs barbs: The corolla is four cleft; the ſtigma pencil'd.

(1.)* AND. *conjunction.* 1. The particle by which ſentences or terms are joined, which it is not eaſy to explain by any ſynonymous.—

Such his honeſty
And filthy beverage, *and* unſeen by thift,
And borrow baſe, *and* ſome good lady's gift.
Spenſer.

2. *And* ſometimes ſignifies *though*, and ſeems a contraction of *and if.*—It is the nature of extremeſelf lovers, as they will ſet an houſe on fire, *and* were but to roaſt their eggs. *Bacon.* 3. In *and if*, the *and* is redundant, and is omitted by all late writers.

I pray thee Launce, *an' if* thou ſeeſt my boy,
Bid him make haſte. *Shakeſpear.*

(2.) AND. *adv.* To the above definitions and illuſtrations of this monoſyllable, given by Dr Johnſon, we cannot help adding, that the word is, or at leaſt has been, often uſed as an adverb inſtead of *now*. Thus, in numberleſs inſtances that occur in the preſent tranſlation of the Bible it is evidently not a *conjunction*, but an adverb:—*e. g.* "*And* it came to paſs,"—"*And* the Lord "ſpake unto Moſes." &c. Conſidering the accuracy, with which Dr Johnſon generally diſtinguiſhes between adverbs and propoſitions, as well as between active and neutral verbs, &c. it is ſurpriſing that this adverbial uſe of the word ſhould have eſcaped him. It is proper to add, however, that this uſe of the word is nearly obſolete.

ANDA, piſon; a tree of Braſil, the wood of which is ſpungy and light; the leaf longiſh, fibrous, and pointed; the flower large and yellow; and the fruit a grey nut, which encloſes, under a double rind, two kernels of the taſte of cheſnuts. The fruit is ſaid to be purgative, and a little cometic: two or three of the kernels are a doſe.—They extract oil by expreſſion from theſe kernels, with which the natives anoint their limbs. The rinds of the fruit are eſteemed proper to ſtop a looſeneſs; thrown into ponds, they kill the fiſh.

ANDABATÆ, [from αναβαινω, mounted,] in antiquity, a ſort of gladiators, who mounted on horſeback or in chariots, fought hoodwinked, having a helmet that covered their eyes.

ANDAJA, a river of Spain in Old Caſtile, which runs into the Duero.

ANDALUSIA, the moſt weſtern province of Spain, bounded on the N. by Eſtremadura, La Mancha, and the Sierra Morena mountains; on the E. by Granada and Murcia; on the S. by the ſtraits of Gibraltar, and the Atlantic Ocean, and on the W. by Alentejo and Algarva in Portugal, from which it is ſeparated by the river Guadiana. It is about 182 miles long, and 150 broad. The chief cities and towns are Seville the capital, Baeza, Gibraltar, Cordova, Cadiz, Medina Sidonia, Jaen, Port St. Mary, &c. It is the beſt, moſt fruitful, and the richeſt part of all Spain, and abounds in all kinds of fruits, wines, grain, fiſh, ſugar, oil, cinnabar, metals, cattle, and horſes. It has a good air, a ſerene ſky, a fertile ſoil, and a great extent on the ſea coaſt fit for commerce.

ANDALUSIA, NEW, a diviſion of the province of Terra Firma in S. America, whoſe boundaries cannot well be aſcertained, as the Spaniards pretend a right to countries in which they have never eſtabliſhed any ſettlements. According to the moſt reaſonable limits, it extends in length 500 miles

miles from N. to S. and about 270 in breadth from E. to W. The interior country is woody and mountainous, variegated with fine valleys that yield corn and paſturage. The produce of the country conſiſts chiefly in dying-drugs, gums, medicinal roots, brazil wood, ſugar, tobacco, and ſome valuable timber. To this province alſo belonged 5 valuable pearl fiſheries. The capital of New Andaluſia is Comana, Cumana, or New Cadova, ſituated in N. Lat. 9° 55′, about nine miles from the north ſea. Here the Spaniards laid the foundation of a town in 1520. The place is ſtrong by nature, and fortified by a caſtle capable of making a vigorous defence; as appeared in the year 1670, when it was aſſaulted by the buccaneers, who were repulſed with very great ſlaughter.

ANDAMAN, or ANDEMAN Iſlands, in the E. Indies, ſituated about 80 leagues diſtance from Tanaſſerim on the coaſt of Siam. They are but little known; only the Eaſt India ſhips ſometimes touch at them, and are ſupplied by the natives with rice, herbs, and fruits: The inhabitants are by ſome repreſented as an harmleſs inoffenſive race of men, and by others as cannibals. Lon. 92. E. Lat. from 10° to 15° N.

ANDANAGAR, or ANDANAGER. See AMADANAGER.

(1) ANDANTE, in muſic, ſignifies a movement moderately ſlow, between *largo* and *allegro*.

2.) ANDANTE LARGO, ſignifies, that though the muſic muſt be performed ſlow, yet the time muſt be obſerved very exactly and the ſound of each note kept diſtinct.

ANDAYE, a town of France, in the department of the lower Pyrenees, famous for its brandy. It is ſeated on the mouth of the Aidaſſoa, oppoſite to Fontarabia, in Spain, 10 miles from Bayonne. Lon. 1. 55. W. Lat. 43. 23. N.

ANDE, a river of Hampſhire, that riſes in the Foreſt of Chute.

ANDECAVI, ANDEGAVI, or ANDES, a people of Gallia Celtica, having the Turones to the E. the Namnetes to the W. the Pictones to the S. and the Aulerci Cœnomani to the N. It is now called ANJOU.

ANDECRIUM. See ANDETRIUM.

ANDECHVI, or ANDECAVUS, a town of Gallia Celtica, now called ANGIERS. Lon. 30. W. Lat. 47. 30. N.

ANDELANGA, or ANDILAGO, in authors of the middle age, occurs as part of the formula of divers donations. In this ſenſe we meet with *donare per andelangam et feſtucam, vendere et tradere per andelangam*, &c. Some will have the term properly to denote what we call an *andiron*; others a long ſtaff, or rod, which it is known was much uſed in the act of putting into poſſeſſion.

ANDELLE, a river of France, in the department of Lower Seine. It riſes in the neighbourhood of Forges, and falls into the Seine. Large rafts of timber cut in the woods of Peitre and Lyons are carried down this river to Paris.

ANDELY, a town of France, in the department of Eure, divided into two parts, by a paved cauſeway. Here is a fountain to which pilgrims formerly flocked from all parts, to be cured of their diſorders, on the feaſt day of the ſaint to which it is dedicated. It is 20 miles SE. of Rouen, and 40 NW. of Paris. Lon. 1. 30. E. Lat. 49. 20. E.

ANDENA, in old writers, denotes the ſwath made in mowing of hay, or as much ground as a man could ſtride over at once.

ANDENAS, iſlands of Norway, in the government of Drontheim.

ANDENAS CASTLE, a ſmall town in Cornwall.

ANDENOEN, an iſland of Norway, in Drontheim.

ANDEOL, ST, a town of France, in the department of Ardache, 5 miles S. of St Viviers. Lon. 2. 50. E. Lat. 44. 24. N.

ANDER. See ANDERO.

ANDERAB, the moſt ſouthern city of the province of Balkh, poſſeſſed by the Uſbeck Tartars. It is very rich and populous, but a place of no great ſtrength. The neighbouring mountains yield excellent quarries of lapis lazuli, in which the Bukhars drive a great trade with Perſia and India. This city is ſituated at the foot of the mountains dividing the dominions of the Great Mogul and Perſia from Great Bukharia. As there is no other way of croſſing theſe mountains but by the road through this city, all travellers with goods muſt pay 4 per cent. On this account the Khan of Balkh maintains a good number of ſoldiers in the place.

ANDERBY-ANIERS, a ſmall town in the N. Riding of Yorkſhire, near Bedal.

ANDERENÆ SAL, in natural hiſtory, a name given by many of the old writers, to the natron or nitre of the ancients. Some have, ſince their time, applied it to our common nitre; and it has been wondered at, that the accounts do not agree with the ſubſtance. But it is to be obſerved, that the natron of the ancients is the ſame as our ſoda, and not at all inflammable with ſulphur as our nitre. No wonder then if the things related of the one ſhould not be found to agree with the other.

ANDERLECHT, a fortreſs of Brabant, two miles N. of Bruſſels.

ANDERNACHT, a city of Cologne, in the circle of the Lower Rhine. It is ſituated in a plain on the Rhine; and is fortified with a wall, caſtle, and bulwarks. It has a trade in ſtone jugs and pitchers, which are ſent to the mineral waters at Dunchſtein. There are 3 monaſteries here and ſeveral churches. Lon. 7. 22. E. Lat. 50. 29. N.

ANDERNESS, [*Acmundarneſſe*, Sax. from *ac*, an oak, *mund*, a mound, and *neſe*, a promontory,] a town in Lancaſhire, ſurrounded with oaks.

ANDERO, ST, a ſeaport town in the bay of Biſcay, in Old Caſtile, ſeated on a ſmall peninſula. It is a trading town, and contains about 700 houſes, 2 pariſh churches, and 4 monaſteries.—Here the Spaniards build and lay up ſome of their men of war. Lon. 4. 30. W. Lat. 43. 30. N.

(1.) ANDERSON, Adam, was for 40 years a clerk in the South Sea Houſe; and at length arrived to his acmè there, being appointed chief clerk of the Stock and New Annuities, which he retained till his death. He was appointed one of the truſtees for eſtabliſhing the colony of Georgia in America; and was alſo one of the court of aſſiſtants of the Scots corporation in London. He publiſhed his Hiſtorical and Chronological Deduction of Trade and Commerce, a work replete with uſeful infor-

mation, about the year 1762. He was twice married: and died at London in 1775.

(2.) ANDERSON, James, D. D. editor of the *Diplomata Scotiæ* and *Royal Genealogies*, was many years minister of the Scots episcopalian church in Swallow Street, Piccadilly, and well known in those days among the people of that persuasion resident in London by the name of *Bishop* Anderson. He was a learned but imprudent man, and lost a considerable part of his property in the fatal year 1720. His Royal Genealogies were printed in large folio. It is a most comprehensive work, and includes almost every person of any eminence, mentioned either in real or fabulous history, from Adam to his own time. He married, and had issue a son, and a daughter who was married to an officer in the army He was brother to Adam, N° 1.

(5.) ANDERSON, Sir Edmund, a younger son of an ancient Scotch family settled in Lincolnshire. He studied at Lincoln College, Oxford: and removed thence to the Inner Temple, where he applied to the law, and became a barrister. In the 9th of queen Elizabeth he was both lent and summer reader, and in the 16th double reader. He was appointed the queen's serjeant at law in the 19th year of her reign; and some time after, one of the justices of assize. In 1582 he was made lord chief justice of the common pleas, and in the year following was knighted. He held his office till his death, in 1605, and was buried at Eyworth in Bedfordshire. He was an able lawyer; but a scourge to the Puritans; and a strenuous supporter of the established church. His works are, 1. Reports of many principal cases argued and adjudged in the time of queen Elizabeth, in the common bench, Lond. 1644, fol. 2. Resolutions and judgments on the cases and matters agitated in all the courts of Westminster, in the latter end of the reign of queen Elizabeth. Published by John Goldsborough, Esq. Lond. 1653, 4to. Besides these, there is a manuscript copy of his Readings still extant.

(4.) ANDERSON, Andrew, a Scotch printer at Edinburgh, who, in the reign of Charles II. obtained a patent for all printing in Scotland, for 41 years. It was afterwards restricted to bibles and acts of parliament.

(5.) ANDERSON, James, was born at Edinburgh, in 1679, and became an advocate. In 1700 he was appointed clerk to the parliament of Scotland, and in 1704, he printed a Vindication of the Independency of Scotland, for which he received the thanks of the parliament, and a pension of 40 l. a-year. He made a collection of Scottish records, which was published in 1 vol. folio, with a preface, by T. Ruddiman. He died in 1712.

(6.) ANDERSON, John, was born at Hamburgh, in 1674, of which city he rose to be syndic, and was employed as negociator of its concerns in different courts of Europe. He published the Natural History of Iceland, Greenland; Davis's Straits, and other northern regions. He died in 1743.

(7.) ANDERSON, George, an English mathematician, born at Weston, in Buckinghamshire, in 1760. He was of low parentage, but by natural genius, he attained a great knowledge of mathematics, which, with other acquirements, recommended him to a clergyman, who sent him to grammar school, and next to New College, Oxford, where he took the degree of M. A. He entered into deacon's orders, but a country curacy not suiting his inclination, he went to London, and obtained a place as clerk to the Board of Controul, under Mr Dundas. Here his assiduity to business brought on a disorder, of which he died, April 30, 1796. He published Arenarius, or a treatise on measuring the sands, translated from the Greek of Archimedes; and a General View of the Variations which have taken place in the Affairs of the East India Company, since the Conclusion of the war in India, in 1784.

(8.) ANDERSON, Alexander, a Scotch mathematician of the 16th century. He was professor of mathematics at Paris, where he published a supplement to Appollonius, in 1592.

ANDERSTON, a populous village within a mile of Glasgow, of which it is one of the suburbs. According to Sir John Sinclair' Statistical Account of that city, Anderston contained 3895 inhabitants, in 1791. See GLASGOW.

(1.) ANDES, a great chain of mountains in South America, which, running from the most northern part of Peru, to the Straits of Magellan, between 3000 and 4000 miles, are the longest and most remarkable in the world. The Spaniards call them the *Cordillera de los Andes*; they form two ridges, the lowermost of which is overspread with woods and groves, and the uppermost covered with everlasting snow. Those who have been at the top, affirm, that the sky is always serene and bright: the air cold and piercing; and yet so thin, that they were scarce able to breathe and the respiration was much thicker than ordinary; and this is attended with retching and vomiting: which, however, has been considered by some as merely accidental. When they looked downwards, the country was hid by the clouds that hovered on the mountain's sides. The mountains just mentioned, which have been frequently ascended, are much inferior in height to many others in this enormous chain.

(2.) ANDES, ACCOUNT OF A PHILOSOPHICAL EXPEDITION UPON THE. The following is the account given of the mountain called Pichincha by the mathematicians, sent by the kings of France and Spain, to make observations, in relation to the figure of the earth. Soon after, our artists arrived at Quito, they determined to continue the series of the triangles for measuring an arch of the meridian to the S. of that city: the company accordingly divided themselves into two bodies, consisting of French and Spaniards, and each retired to the part assigned them. Don George Juan, and M. Godin, who were at the head of one party, went to the mountain of Pambamarca; while M. Bouguer, de la Condamine, and Don Ulloa, together with their assistants, climbed up to the highest summit of Pichincha. Both parties suffered extremely, as well from the severity of the cold, as from the impetuosity of the winds, which, on these heights blow with incessant violence; difficulties the more painful, as they had been little used to such sensations. Thus, in the torrid zone, nearly under the equinoctial, where it is natural to suppose they

they had moſt to fear from the heat, their greateſt pain was cauſed, by the exceſſiveneſs of the cold. Their firſt ſcheme, for ſhelter and lodging, in theſe uncomfortable regions, was, to pitch a field tent for each company; but on Pichincha, this could not be done, from the narrowneſs of the ſummit: they were therefore obliged to be contented with a hut, ſo ſmall, that they could hardly all creep into it. Nor will this appear ſtrange, if the reader conſiders the bad diſpoſition and ſmallneſs of the place, it being one of the higheſt crags of a rocky mountain, 100 fathoms above the higheſt part of the deſart of Pichincha. Such was the ſituation of their manſion, which, like all the other adjacent parts, ſoon became covered with ice and ſnow. The aſcent up this ſtupendous rock, from the baſe, or the place where the mules could come, to their habitation, was ſo craggy, as only to be climbed on foot; and to perform it, coſt them four hours continual labour and pain, from the violent efforts of the body, and the ſubtility of the air; the latter being ſo thin, and probably overcharged with the lighter reſpirable gaſes, as to render reſpiration difficult.—The ſtrange manner of living, to which our artiſts were reduced, during the time they were employed in a geometrical menſuration of ſome degrees of the meridian, may not prove unentertaining to the reader; and therefore, the following account is given, as a ſpecimen of it. The deſart of Pichincha, both with regard to the operations performed there, and its inconveniences, differing very little from others, an idea may be very eaſily formed of the fatigues, hardſhips, and dangers, to which they were continually expoſed, during the time they were proſecuting the enterpriſe, with the conduct of which they had been honoured. The principal difference between the ſeveral deſarts conſiſted in their greater or leſſer diſtance from places where they could procure proviſions; and in the inclemency of the weather, which was proportionate to the height of the mountains, and the ſeaſon of the year.

(3.) ANDES, CLIMATE OF THE. Our philoſophers generally kept within their hut. Indeed, they were obliged to do this, on account of the intenſeneſs of the cold, the violence of the wind, and their being continually involved in ſo thick a fog, that an object at ſix or eight paces, was hardly diſcernible. When the fog cleared up, the clouds, by their gravity, moved nearer to the ſurface of the earth, and on all ſides ſurrounded the mountains to a vaſt diſtance, repreſenting the ſea, with their rock, like an iſland, in the centre of it. When this happened, they heard the horrid noiſes of the tempeſts, which then diſcharged on Quito and the neighbouring country. They ſaw the lightnings iſſue from the clouds, and heard the thunders roll far beneath them; and whilſt the lower parts were involved in tempeſts of thunder and rain, they enjoyed a delightful ſerenity; the wind was abated, the ſky clear, and the enlivening rays of the ſun moderated the ſeverity of the cold. But their circumſtances were very different, when the clouds roſe: their thickneſs rendered reſpiration difficult; the ſnow and hail fell continually; and the wind returned with all its violence; ſo that it was impoſſible entirely to overcome the fears of being, together with their hut, blown down the precipice, on whoſe edge it was built, or of being buried under it, by the daily accumulations of ice and ſnow. The wind was often ſo violent in theſe regions, that its velocity dazzled the ſight, whilſt their fears were increaſed, from the dreadful concuſſions of the precipice, cauſed by the fall of enormous fragments of rocks. Theſe craſhes were the more alarming, as no other noiſes are heard in theſe deſarts: and during the night, their reſt, which they ſo greatly wanted, was frequently diſturbed by ſuch ſudden ſounds.—When the weather was fair near their hut, and the clouds gathered about ſome of the other mountains, which they had ſelected for their obſervations, ſo that they could not make all the uſe they deſired, of this interval of good weather, they left their hut to exerciſe themſelves. Sometimes they deſcended to a ſmall diſtance; and at other times, amuſed themſelves with rolling large fragments of rocks down the precipice; and theſe frequently required the joint ſtrength of them all, though they often ſaw the ſame effected by the mere force of the wind. But they always took care, in their excurſions, not to go ſo far out, but that, on the leaſt appearance of the clouds gathering about their cottage, which often happened very ſuddenly, they could regain their ſhelter. The door of their hut was faſtened with thongs of leather, and on the inſide, not the ſmalleſt crevice was left unſtopped; beſides which, it was very compactly covered with ſtraw: but, notwithſtanding all their care, the wind penetrated through. The days were often little better than the nights; and all the light they enjoyed, was that of a lamp or two, which they kept continually burning. Though their hut was ſmall, and crowded with inhabitants, beſides the heat of the lamps; yet the intenſeneſs of the cold was ſuch, that every one of them was obliged to have a chafing diſh of coals. Theſe precautions would have rendered the rigour of the climate ſupportable, had not the imminent danger of periſhing, by being blown down the precipice, rouſed them, every time it ſnowed, to encounter the ſeverity of the outward air, and ſally out, with ſhovels, to free the roof of their hut from the maſſes of ſnow which were gathering on it. Nor would it, without this precaution, have been able to ſupport the weight. They were not indeed without ſervants and Indians; but theſe were ſo benumbed with the cold, that it was with great difficulty they could get them out of a ſmall tent, where they kept a continual fire. So that all our artiſts could obtain from them, was to take their turns in this labour; and even then they went very unwillingly about it, and conſequently performed it ſlowly.

(4.) ANDES, DIFFICULTIES ATTENDING THE EXPEDITION TO. The reader may eaſily judge what our philoſophers ſuffered from the aſperities of ſuch a climate. Their feet were ſwelled; and ſo tender, that they could not even bear the heat; and walking was attended with extreme pain. Their hands were covered with chilblains; their lips ſwelled and chopped; ſo that every motion in ſpeaking, or the like, drew blood; conſequently

they were obliged to ſtrict taciturnity, and little diſpoſed to laugh, as, by cauſing an extenſion of the lips, it produced ſuch fiſſures as were very painful for two or three days after. Their common food in this inhoſpitable region was a little rice boiled with ſome fleſh or fowl, procured from Quito; and, inſtead of fluid water, their pot was filled with ice; they had the ſame reſource with regard to what they drank; and while they were eating, every one was obliged to keep his plate over a chafing-diſh of coals, to prevent his proviſions from freezing. The ſame was done with regard to the water. At firſt they imagined the drinking ſtrong liquors would diffuſe a heat through the body, and conſequently render it leſs ſenſible of the painful ſharpneſs of the cold: but, to their ſurpriſe, they felt no manner of ſtrength in ſuch liquors, nor were they any greater preſervative againſt the cold than the common water. At the ſame time, they found it impoſſible to keep the Indians together. On their firſt feeling of the climate, their thoughts were immediately turned on deſerting their maſters. The firſt inſtance they had of this kind was ſo unexpected, that had not one, of a better diſpoſition than the reſt, ſtaid and acquainted them of their deſign, it might have proved of very bad conſequence. The affair was this: There being on the top of the rock no room for pitching a tent for the Indians, they uſed every evening to retire to a cave at the foot of the mountain; where, beſides a natural diminution of the cold, they could keep a continual fire; and, conſequently, enjoy more comfortable quarters than their maſters. Before they withdrew at night, they faſtened, on the outſide, the door of the hut, which was ſo low that it was impoſſible to go in or out without ſtooping; and as every night the hail and ſnow which had fallen formed a wall againſt the door, it was the buſineſs of one or two of the Indians to come early and remove this obſtruction. For though the negro ſervants were lodged in a little tent, their hands and feet were ſo covered with chilblains, that they would rather have ſuffered themſelves to have been killed than move. The Indians therefore came conſtantly up to diſpatch this work betwixt nine and ten in the morning: but they had not been there above four or five days, when they were not a little alarmed to ſee ten, eleven, and twelve o'clock come, without any news of their labourers; when they were relieved by the honeſt ſervant mentioned above, who had withſtood the ſeduction of his countrymen, and informed his maſters of the deſertion of the four others. As ſoon as the ſnow was cleared away from the door, they diſpatched the Indian to the corregidor of Quito, who with equal diſpatch ſent other Indians, threatening to chaſtiſe them ſeverely if they were wanting in their duty. But the fear of puniſhment was not ſufficient to induce them to ſupport the rigour of this ſituation; for within two days they alſo deſerted. The corregidor therefore, to prevent any other inconvenience, ſent four Indians under the care of an alcalde, and gave orders for their being relieved every fourth day.

(5.) ANDES, EXPEDITION AMONGST THE, CONCLUDED. Our philoſophers ſpent no fewer than 23 tedious days on this rock, without any poſſibility of finiſhing their obſervations of the angles; for when it was fair and clear weather with them, the others, on whoſe ſummits the ſignals which formed the triangles for meaſuring the degrees of the meridian, were hid in the clouds; and when thoſe were clear, Pichincha was involved in clouds. It was therefore neceſſary to erect their ſignals in a lower ſituation, and in a more favourable region. This, however, did not produce any change in their habitation till the beginning of December; when, having finiſhed the obſervations which particularly concerned Pichincha, they proceeded to others; but with no abatement either of inconveniences, cold, or fatigue; for the places where they made their obſervations being neceſſarily on the higheſt parts of the deſarts, the only reſpite in which they enjoyed ſome little eaſe was during the ſhort interval of paſſing from one to the other. In all their ſtations ſubſequent to that on Pichincha, during their fatiguing menſuration of the degrees of the meridian, each company lodged in a field-tent, which, though ſmall, they found leſs inconvenient than the hut on Pichincha; though at the ſame time they had more trouble, being oftener obliged to clear it from the ſnow, as the weight of it would otherwiſe have demoliſhed the tent. At firſt, indeed, they pitched it in the moſt ſheltered places; but on taking a reſolution that the tents themſelves ſhould ſerve for ſignals, to prevent the inconvenience of having others of wood, they removed them to a more expoſed ſituation, where the impetuoſity of the winds ſometimes tore up the piquets, and blew them down. Though this mountain is famous for its great height, it is conſiderably lower than the mountain of Cotopaxi: but it is impoſſible to conceive the coldneſs of the ſummit of the laſt mentioned mountains from that felt on this; ſince it muſt exceed every idea that can be formed by the human mind, though they are both ſeated in the midſt of the torrid zone. In all this range of mountains, there is ſaid to be a conſtant inferior boundary, beyond which the ſnow never melts; this boundary, in the midſt of the torrid zone, is ſaid by ſome to be 2434 fathoms above the level of the ſea; by others, only 2400 feet. The ſnow indeed falls much lower, but then it is ſubject to be quickly melted.

(6.) ANDES, VOLCANOES, HEIGHT, RIVERS, &c. OF THE. It is affirmed, that there are in the Andes 16 volcanoes or burning mountains, which throw out fire and ſmoke with a terrible noiſe. The height of Chimborazo, ſaid to be the higheſt peak of the Andes, has been determined by geometrical calculations to be 20,282 feet, but the great differences between the calculators of the height of mountains in other parts of the world muſt very much diminiſh the credit of ſuch calculations. Inſtances of this we have already given under the article ÆTNA. No leſs remarkable are the differences concerning the height of the peak of Teneriffe; which, according to the calculations of Varenius, is three miles and three quarters, or 19,800 feet; according to thoſe of Dr Heberden, it is only 15,396 feet; and according to thoſe of M. Feuille, is no more than 13,128 feet. From theſe ſpecimens, we can ſcarce avoid concluding

ding, that all the methods hitherto invented for calculating the exact height of mountains are inſufficient. As all or moſt rivers have their ſource in mountains, it is no wonder a great number run down the ſides of the Andes. Some hurry along with a prodigious rapidity; while others form beautiful caſcades, or run through holes in rocks, which look like bridges of a ſtupendous height. There is a public road through the mountains, 1100 miles in length, part of which runs from Quito to Cuſco.

(II.) ANDES, a hamlet of Mantua in Italy, the birth place of Virgil; now called *Pietola*, two miles W. of Mantua.

ANDETRIUM, ANDRETIUM, ANDECRIUM, or ANDRECIUM; an inland town of ancient Dalmatia, ſituated near Salonæ, on a ſtrong and inacceſſible rock, ſurrounded with deep valleys, and rapid torrents; now called *Cliſſa*. Lon. 17. 46. E. Lat. 43. 20. N.

ANDEUSE, a city of France, in the ci-devant province of Languedoc. Lon. 3. 40. E. Lat. 43. 45. N.

ANDI, or ANDES. See ANDECAVI.

ANDINUS, a native of Andes in Italy.

(1.) ANDIRA ANGELYN, in botany, *G. Piſon*; a tree in Brazil, the wood of which is hard and proper for building. Its bark is of an aſh-colour; its fruit is of the ſhape and ſize of an egg, green at firſt, but growing blacker by degrees. It is covered with a hard rind, incloſing a grain, or trilowiſh kernel, of a bitteriſh, aſtringent taſte. They pulverize this nut, and give it for worms; but not more than one ſcruple; for more than this is ſaid to be poiſonous.

(2.) ANDIRA, or ANCIRA-GUACU, in zoology, a kind of bat in Brazil; the largeſt of which are as big as our pigeons: they call them horned bats, from a ſort of excreſcence above their beak. Some of them are very dangerous; for they get into chambers in the night, and ſo ſubtily open the veins in the feet of thoſe who are in bed, that they are not perceived but by the flowing of the blood, which is difficult to be ſtopped. The inhabitants reckon the tongue and heart of this animal poiſonous.

ANDIRIAR, in botany, the name by which Piſo, and others, expreſs the fabago.

ANDIRON. *n. ſ.* [ſuppoſed by *Skinner* to be corrupted from *handiron*; an iron that may be moved by the hand, or may ſupply the place of a hand.] Irons at the end of a fire-grate, in which the ſpit turns; or irons in which wood is laid to burn.—If you ſtrike an entire body, as an *andiron* of braſs, at the top it maketh a more treble ſound, and at the bottom a baſer. *Bacon.*

ANDLAU, a river of lower Alſace, in France, which riſes in the Waſgan mountains and falls into the Ill.

ANDOCIDES, an Athenian orator, four of whoſe orations are extant; and upon which Harpocration wrote his Lexicon.

ANDOLITE, a town of France, in the department of Maine.

ANDOMADUNUM, ANDOMATUNUM, or ANTIMATUNUM, in ancient geography, called by Tacitus, CIVITAS LIEGONUM, a city of Gallia Belgica; now called *Langres* in Champagne, ſituated on an eminence which ſeems to juſtify the termination *dunum*, on the borders of Burgundy, at the ſprings of the Maine. Lon. 5. 22. E. Lat. 48. 0. N.

ANDONNILLE, a town of France, near Paris.

ANDORA, a large village of Genoa, which produces excellent wine.

ANDORINHA, in ornithology, a name by which the Portugueſe in the Braſils call the Braſilian ſwallow, more uſually known by its Braſilian name *tapera*.

ANDORNO, a ſmall town in Piedmont.

ANDOVER, a large well built, populous town in Hampſhire, on the London road; pleaſantly ſituated on the Ande, and on the edge of the Downs. It is a great thoroughfare between London and Wiltſhire, Newbury and Saliſbury; and ſends two members to parliament. It has ſeveral inns, which afford good accommodation to travellers; and a market on Saturday, well ſtocked with proviſions. It is governed by a bailiff, a ſteward, a recorder, ten councillors and twenty-two burgeſſes, who chuſe the bailiff annually, and he appoints two ſerjeants at mace to attend him. The vicarage is valued at 171l. 4s. 4d. in the king's books. It lies 10 miles N. by W. of Wincheſter, and 65 W. by S of London. It has a weekly market on Saturday, and fairs on Thurſday and Friday, the 3d week in lent, 12 May and 6 Nov. It carries on a manufacture of ſhalloons and a great malting. Lon. 0. 56. W. Lat. 51. 20. N.

ANDRACHNE, BASTARD ORPINE: A genus of the gynandria order, belonging to the monœcia claſs of plants; and in the natural method ranking under the 38th order, Tricoccæ. The characters are: The male calyx conſiſts of five leaves; there is no corolla; the ſtyli are three; and the capſule is trilocular, containing three ſeeds.

1. ANDRACHNE ARBOREA, has a tree-like ſtalk, and was diſcovered by the late Dr William Houſton, growing naturally at Campeachy. It has a ſtrong woody ſtem, which riſes more than 20 feet high, and ſends out many branches on every ſide. It has not yet flowered in Britain.

2. ANDRACHNE FRUTICOSA, or ſhrubby baſtard orpine, is a native of China and ſome places of America, where it riſes 12 or 14 feet high. The leaves are ſpear-ſhaped, pointed, and ſmooth; and under them are produced the footſtalks of the flowers, which are ſmall, and of an herbaceous white colour.

3. ANDRACHNE JAMAICENSIS is a ſpecies mentioned by Mr Millar as raiſed by him from ſeeds ſent from Jamaica. It agrees in general with the firſt ſort; but the leaves are ſomewhat like the laurel, only much larger. All theſe ſpecies are very tender, and therefore muſt be kept conſtantly in the bark ſtove. It is very difficult to procure good ſeeds of theſe ſorts; the covers often containing nothing, though they appear very fair outwardly. Of all the ſeeds ſent over by Dr Houſton, only one was found to contain a kernel, ſo that only one plant was produced.

4. ANDRACHNE TELEPHOIDES, or herbaceous trailing andrachne, is a low plant, whoſe branches trail upon the ground. The leaves are ſmall, of an oval ſhape, ſmooth, and of a ſea-green colour. It is found wild in ſome parts of Italy and the Archipelago;

chipelago; but is a plant of no great beauty, and therefore ſeldom cultivated. It may be raiſed by ſowing the ſeeds in March, on a moderate hot-bed. The plants may be removed into ſmall pots and plunged into another very moderate hot-bed, to bring them forward; but in mild weather they ſhould have plenty of air admitted to them, and be frequently refreſhed with water. In June they will produce flowers, and the ſeeds will ripen in Auguſt and September.

(II.) ANDRACHNE is alſo a name given, by the ancients, ſometimes to a tree of the *arbutus* or ſtrawberry tree kind, and ſometimes to the herb, purſlain. Some of the later Latin writers have alſo called it *porcala*, and ſome of the later Greeks *cairabotanon*.

(1.) ANDRADA, Diego de Payva, d', or ANDRADIUS, a learned Portugueſe, born at Conimbria, who diſtinguiſhed himſelf at the council of Trent, where king Sebaſtian ſent him as one of his divines. He died in 1575, aged 47. There is ſcarce any Catholic author who has been more quoted by the Proteſtants than he, becauſe he maintained ſome liberal opinions concerning the ſalvation of the Heathens. Andrada was eſteemed an excellent preacher.

(2.) ANDRADA, Francis, brother of Diego, was hiſtoriographer to the king of Spain, and wrote the hiſtory of John III. king of Portugal, printed in 1533.

(3.) ANDRADA, Thomas, another brother of the above, aſſumed the habit of a monk, and was called by his order *Thomas of Jeſus*. He attended king Sebaſtian to Africa, where he was confined in a cave by the Moors. Here he wrote a book, which he called the *Sufferings of Jeſus*; and which has been tranſlated into Engliſh by Welton. He died in 1582.

ANDRAGHIIRA, a river of Sumatra, upon which the Dutch have a factory.

ANDRAIG, a ſea port of Madeira, with a fort.

ANDRAPODISMUS, in ancient writers, the ſelling of perſons for ſlaves.

ANDRAPODISTES, [ἀνδραποδιστης,] a dealer in ſlaves, more particularly a kidnapper, who ſteals men or children, to ſell them; a crime the Theſſalians were noted for.

ANDRAPODOCAPELI, in antiquity, a kind of dealers in ſlaves. The *andrapodocapeli* had a particular proceſs of taking off moles, and the like diſfigurements on the faces of the ſlaves they kept for ſale, by rubbing them with bran. At Athens ſeveral places in the forum were appointed for the ſale of ſlaves. Upon the firſt day of every month, the merchants brought them into the market and expoſed them to ſale, whilſt the crier, ſtanding upon a ſtone erected for that purpoſe, called the people together.

ANDRARUM, a town of Sweden, in S. Gothland, near 3 miles S. of Chriſtianſtadt, where there is the greateſt alum work in the kingdom.

ANDRE, Major J. an adjutant-general in the Britiſh army, who fell a ſacrifice to his zeal for his country, during the American war. Being employed to negociate the defection of Arnold and his troops, he was apprehended in diſguiſe on the 2d September 1780, by three Americans, to whom he offered his watch and money to let him eſcape, but in vain. Being ſent priſoner to General Waſhington, that general ſubmitted his caſe to the examination and deciſion of a board of general officers, conſiſting of Major-generals Greene, Lord Stirling, the Marquis de la Fayette, the Baron de Stenben, two other major-generals, and 8 brigadier-generals. Major Andre was examined before them, and the particulars of his conduct inquired into; and they reported to the American commander in chief, that Mr Andre came on ſhore from the Vulture ſloop of war, in the night, on an interview with General Arnold, in a private and ſecret manner; that he changed his dreſs within the American lines; and, under a feigned name, and in a diſguiſed habit, paſſed the American works at Stoney and Verplank's points, on the evening of the 22d of September; that he was taken on the morning of the 23d at Tarry-town, he being then on his way for New York; and that, when taken, he had in his poſſeſſion ſeveral papers which contained intelligence for the enemy. They therefore determined, that he ought to be conſidered as a *ſpy* from the enemy; and that, agreeable to the law and uſage of nations, he ought to ſuffer death. Sir Henry Clinton, Lieutenant-general Robertſon, and the late American general Arnold, all wrote preſſing letters to General Waſhington on the occaſion, in order to prevent the deciſion of the board of general officers from being put in force: But their applications were ineffectual. Major Andre was hanged at Tappan, in the province of New York, on the 2d of October. He met his fate with great firmneſs; but appeared ſomewhat hurt that he was not allowed a more military death, for which he had ſolicited. He was a gentleman of very amiable qualities, had a taſte for literature and the fine arts, and poſſeſſed many accompliſhments. His death, therefore, was regretted even by his enemies; and the ſeverity of the determination concerning him was much exclaimed againſt in Great Britain. It was, however, generally acknowledged by the impartial, that there was nothing in the execution of this unfortunate gentleman but what was perfectly conſonant to the rules of war. An elegant monument is erected to his memory in Weſtminſter Abbey.

ANDRE, St, the name of ſeveral different places, viz. 1. diſtrict of Corſica; 2. and 3. two towns of France in the department of Mont Blanc: 4. another in the ci-devant province of Languedoc: 5. another in the department of Rhone and Loire: and, 6. a village of Northumberland, 6 miles E. of Hexham. See alſo next article.

ANDRE, St. DE BEAULIEU, a town of France, in the department of Indre and Loire.

ANDREA, St, a ſmall village on the Malabar coaſt in the Eaſt Indies, founded originally by the Portugueſe. It takes its name from a church dedicated to St Andrew, and ſerved by the prieſts of St Thomas.—On the ſhore of St Andrea, about half a league out in the ſea, lies Mud bay, a place which few in the world can parallel. It is open to the wide ocean, and has neither iſland nor bank to break the force of the billows, which come rolling with great violence from all parts, during

during the SW. Monſoons; but on this bank of mud they loſe their force in a moment; and ſhips lie on it as ſecure as on the beſt harbour, without motion or diſturbance. It reaches about a mile along ſhore, and has been reported to ſhift its place from the northward about 3 miles in 30 years. From St Andrea to Kranganor, about 12 leagues to the ſouth, the water has the bad property of cauſing ſwellings in the legs of thoſe who drink it conſtantly. Some it affects in one leg, and ſome in both. It cauſes no pain, but itching; nor does the ſwelled leg ſeem heavier to the owner than the ſmall one, though ſome have been ſeen a yard in circumference at the ancle.

ANDREÆ, John Gerhard Reinhard, an ingenious naturaliſt of Hanover, was born in 1724. He ſucceeded his father in the buſineſs of an apothecary; and gained an extenſive knowledge in chemiſtry, botany, and natural hiſtory. He publiſhed ſeveral pieces, on theſe ſubjects, particularly a Tour in Switzerland, 1776, 4to.; and a Treatiſe on the ſeveral kinds of Earth in Hanover, 1779. He died in 1793.

(1.) ANDREAS, James, an eminent German reformer, born in the duchy of Wirtemberg, in 1528. In 1546, he was appointed miniſter of the church of Stutgard. He was at the diet of Ratiſbon, and was one of the ſecretaries at the conference at Worms. He was likewiſe at the diet of Augſburg; and ſoon after was appointed chancellor and rector of the univerſity of Tubingen. He died in 1590. He wrote ſome learned treatiſes, particularly one on *Concord*; and was much taken up in reforming the German churches.

(2.) ANDREAS, John, a celebrated canoniſt in the 14th century, was born at Mugello, near Florence; and was profeſſor of canon law at Padua, Piſa, and afterwards at Bologna. It is ſaid that he macerated his body with faſting; and lay upon the bare ground every night for twenty years together, covered only with the ſkin of a bear. This is atteſted by very good authors; but if the ſtory which Poggius tells of him in his Jeſts be true, he muſt afterwards have relaxed much of this diſcipline. The ſtory has been hackenied both in Latin and French, with ſome humour; but in a *ſtrain of wit*, with which we will not diſgrace our Dictionary. It is on all hands, however, agreed, that John Andreas had a baſtard by his ſervant girl, and therefore Poggius's ſtory is very problematic; and it was perhaps with the mother of Baconius that his wife detected him. Andreas had a beautiful daughter, named *Novella*, whom he loved extremely: and he is ſaid to have inſtructed her ſo well in all parts of learning, that when he was engaged in any affair which hindered him from reading lectures to his ſcholars, he ſent his daughter in his ſtead; and leſt her beauty ſhould prevent the attention of the hearers, ſhe had a little curtain drawn before her. The firſt work of Andreas was his Gloſs upon the Sixth Book of the Decretals, which he wrote when he was very young. He wrote alſo Gloſſes upon the Clementines; and a commentary *in regulas Sexti*, which he entitled *Mercuriales*, becauſe he inſerted his Wedneſdays diſputes in it. He enlarged the Speculum of Durant, in 1347; and died of the plague at Bologna, in 1348, after he had been a profeſſor 45 years; and was buried in the church of the Dominicans. He has been called *Archidoctor decretorum*, and in his epitaph, *Rabbi doctorum; lux, cenſor, normaque morum*; Rabbi of the doctors, the light, cenſor, and rule of manners. Pope Boniface called him *lumen mundi*, the light of the world.

(3.) ANDREAS, John, was born a Mahometan, at Xativa in the kingdom of Valencia, and ſucceeded his father as alfaqui of that city. He was converted to the Chriſtian religion by hearing a ſermon in the great church of Valencia on the day of aſſumption, in 1487. Upon this he deſired to be baptized; and, in memory of the calling of St John and St Andrew, he received the name John Andreas. "Having received holy orders (ſays he), and, from an alfaqui and a ſlave of Lucifer, become a prieſt and miniſter of Chriſt; I began, like St Paul, to preach and publiſh the contrary of what I had erroneouſly believed and aſſerted; and, with the aſſiſtance of Almighty God, I converted at firſt a great many ſouls of the Moors, who were in danger of hell, and under the dominion of Lucifer, and conducted them into the way of ſalvation. After this, I was ſent for by the moſt Catholic princes king Ferdinand and queen Iſabella, to preach in Granada to the Moors of that kingdom. By God's bleſſing on my preaching, an infinite number of Moors were brought to abjure Mahomet, and turn to Chriſt." After this he was made a canon by their majeſties: and at the deſire of Martin Garcia, biſhop of Barcelona, he undertook to tranſlate from the Arabic, into the language of Arragon, the whole law of the Moors. Having finiſhed this undertaking, he compoſed his famous work of *The Confuſion of the Sect of Mahumed*. It contains 12 chapters, wherein he has collected the fabulous ſtories, impoſtures, forgeries, brutalities, follies, obſcenities, abſurdities, impoſſibilities, lies, and contradictions, which Mahomet, in order to deceive the ſimple people, has diſperſed in the writings of that ſect, and eſpecially in the Alcoran. This book, which was publiſhed at firſt in Spaniſh, has been tranſlated into ſeveral languages. It is generally quoted againſt the Mahometans.

(4.) ANDREAS, Novella, the learned daughter of John Andreas. See N° 2. She was married to John Calderinus, a learned canon. To perpetuate her memory, her father entitled his Commentary on the Decretals of Gregory IX. *Novellæ*.

ANDREAS, ST, a town of France, in the department of Gironde.

ANDREASBERG, a town of Brunſwick Lunenburg, which has rich iron mines.

ANDRECIUM. See ANDETRIUM.

ANDREINI, Iſabella, a native of Padua, an excellent poeteſs, and one of the beſt comedians in Italy, towards the beginning of the 17th century. The Intenti of Pavia thought they did their ſociety an honour, by admitting her a member of it; and ſhe, in acknowledgment of this honour, never forgot to mention, amongſt her titles, that of *Academica Infunta*: her titles were theſe, "Iſabella Andreini, comica geloſa, academica infanta, detta l'acceſſa." She was alſo a woman of extraordinary beauty: which, added to a fine voice, made her charm both the eyes and

and ears of the audience. She died at Lyons, 10th June, 1604, aged 42. Her death being a matter of general concern and lamentation, there were many Latin and Italian elegies printed to her memory: several of these pieces were placed before her poems, in the edition of Milan, in 1605. Besides her sonnets, madrigals, songs, and eclogues, there is a pastoral of hers, entitled Myrtilla, and letters, printed at Venice in 1610.

ANDRELINUS, Publius Faustus, born at Forli in Italy. He was long professor of poetry and philosophy, in the university of Paris. Lewis XII. made him his poet laureat. His pen was not wholly employed in making verses; for he wrote also moral and proverbial letters in prose, which were printed several times. His poems, which are chiefly in Latin, are inserted in Vol. I. of the *Deliciæ Poetarum Italorum*. M. De la Monnoie tells us, "that Andrelinus, when he was but 22 years old, received the crown of laurel: That his love verses, divided into 5 books, entitled *Livia*, from the name of his mistress, were esteemed so fine by the Roman academy, that they adjudged the prize of the Latin elegy to the author." He died in 1518.

ANDRESWALD, [from *andred*, fear, and *wald*, a wood, Sax. i. e. a terrible wood,] an extensive wood of 12 miles in length, lying partly in Sussex, and partly in Kent.

ANDRETIUM. See ANDETRIUM.

ANDREW, St, the apostle, born at Bethsaida in Galilee, brother to Simeon Peter. He had been a disciple of John the baptist, and followed Jesus upon the testimony given of him by the baptist. His history, so far as is recorded in the gospels, we need not here repeat. After our Saviour's ascension, his apostles having determined by lot what parts of the world they should severally take, Scythia and the neighbouring countries fell to St Andrew, who, according to Eusebius, after he had planted the gospel in several places, came to Patræ in Achaia, where, endeavouring to convert the proconsul Ægeas, he was by that governor's orders scourged, and then crucified. The particular time of his suffering martyrdom is not known; but all the ancient and modern martyrologies, both of the Greeks and Latins, agree in celebrating his festival upon the 30th of November. His body was embalmed, and decently interred at Patræ by Maximilla, a lady of great quality and estate. Afterwards it was removed to Constantinople by Constantine the Great, and buried in the great church, which he had built to the honour of the apostles. There is a cross to be seen at this day in the church of St Victor at Marseilles, which is believed by the Romanists to be the same that St Andrew was fastened to. It is in the shape of letter X, and is inclosed in a silver shrine. Peter Chrysologus says, that he was crucified upon a tree; and the spurious Hippolytus assures us it was an olive tree.

ANDREW, St, a town of Germany, in the circle of Austria, and duchy of Carinthia, with a bishop's see; seated on the Levant.

ANDREW, St, KNIGHTS OF, an order of knights, more usually called the order of the thistle. (See THISTLE.) The knights of St Andrew, are also an order instituted by Peter the Great of Muscovy in 1697; the badge of which is a golden medal; on one side whereof is represented St Andrew's cross, with these words, *Tzar Pierre monarque de tout la Russie*. This medal is suspended by a blue ribbon from the right shoulder.

ANDREW'S CASTLE, St, a village in Hampshire, between Southampton and Petersfield.

ANDREW'S CROSS, St, one in form of the letter X. See CROSS.

ANDREW'S DAY, St, a festival of the Christian church, celebrated on the 30th of November, in honour of the apostle St Andrew.

ANDREWS, Lancelot, bishop of Winchester, was born at London in 1555, and educated at Cambridge. After several preferments, he was made bishop, first of Chichester, then of Ely, and, in 1618, was raised to the see of Winchester. This learned prelate, who was distinguished by his piety, charity, and integrity, may be justly ranked with the best preachers and completest scholars of his age. He appeared to much greater advantage in the pulpit than he does now in his works, which abound with Latin quotations and trivial witticisms; suited to the taste of the times in which he lived. He was a man of polite manners and lively conversation; and could quote Greek and Latin authors, and even pun, with king James. When Waller the poet was young, he had the curiosity to go to court, and stood in the circle to see king James dine; where, among other company, there sat at table two bishops, Neale and Andrews. The king asked aloud, Whether he might not take his subjects' money when he needed it, without all this formality of parliament? Neale replied, "God forbid you should not; for you are the breath of our nostrils." Whereupon the king said to the bishop of Winchester, "Well, my lord, what say you?" "Sir, (replied the bishop,) I have no skill of parliamentary cases." The king answered, "No put-offs, my lord; answer me presently." "Then, Sir, (said he,) I think it lawful for you to take my brother Neale's money, for he offers it."—This great prelate died at Winchester-house in 1626, aged 71, and was buried in the church of St Saviour's, where his executors erected to him a monument of marble and alabaster, on which is an elegant inscription in Latin. Milton also, at 17 years of age, wrote a beautiful Latin elegy on his death. Bishop Andrews had, 1. A share in the translation of the Bible, from Genesis to 2 Kings inclusively. He also wrote, 2. *Tortura Torti*, in answer to a work of cardinal Bellarmine, in which that prelate assumed the name of Matthew Tortus. 3. A Manual of Private Devotions: and, 4. A Manual of Directions for the Visitation of the Sick: besides Sermons and Tracts, in English and Latin, published after his death.

(1.) ANDREWS, St, a royal borough of Fifeshire in Scotland, formerly the metropolis of the Pictish kingdom. It is seated on a bay, on the level top of a small hill, 32 miles from Edinburgh, commanding a view of the German ocean Lon. 2. 45. W. Lat. 56. 18. N. See the following sections.

(2.) ANDREWS, St, ANCIENT ACCOUNTS OF

If we may credit the legend, St Andrew's owes its origin to a fingular accident. St Regulus, or St *Rule*, as he is likewife called, a Greek of Achaia, was warned by a vifion to leave his native country, and vifit Albion, an ifle placed in the remoteft part of the world; and to take with him the arm bone, three fingers, and three toes, of St Andrew. He obeyed, and fet fail with his companions, but had a very tempeftuous paffage. After being toffed for fome time on a ftormy fea, he was at laft fhipwrecked on the coafts of Othonia, in the territories of Ungus king of the Picts, in the year 270. On hearing of the arrival of the ftrangers, with their precious relicts, the king immediately gave orders for their reception, afterwards preferting the faint with his own palace, and building near it the church, which ftill bears the name of *St Regulus*. At this time the place was ftyled *Mucrofs*, or the *land of boars*; all round was foreft, and the lands beftowed on the Saint were called *Byrchid*. The boars equalled in fize the ancient Erymanthian: as a proof of which, two tufks, each fixteen inches long and four thick, were chained to the altar of St Andrew. St Regulus changed the name to *Kilrymont*; and eftabliffied here the firft Chriftian priefts of the country, called *Culdees*. This church was fupreme in the kingdom of the Picts; Ungus having granted to God and St Andrew, that it fhould be the head and mother of all the churches in his dominions. He alfo directed that the crofs of St Andrew fhould become the badge of the country. In 518, after the conqueft of the Picts, the epifcopal fee was removed to St Andrew's and the Bifhop was ftyled *maximus Scotorum epifcopus*. In 1441, it was erected into an archbifhopric by Sextus IV. at the interceffion of James III. In 1626, the priory was fuppreffed; and, in 1617, the power of election was transferred to eight bifhops, the principal of St Leonard's college, the archdeacon, the vicars of St Andrew's, Leuchars, and Coupar. This fee contained the greateft part of the fhire of Fife, with a part of Perth, Forfar, and Kincardine fhires, and a great number of parifhes, churches, and chapels in other dioceffes. The town of St Andrew's was erected into a royal borough by David I. in the year 1140, and their privileges afterwards confirmed. The charter of Malcolm II. is preferved in the tolbooth; and is written on a bit of parchment, but the contents were equally valid with what would at this time require whole fkins. Here alfo are kept the filver keys of the city; which, for form's fake, are delivered to the king, if he fhould vifit the place, or to a victorious enemy, in token of fubmiffion. In this place likewife, is to be feen the monftrous axe which, in 1646, took off the heads of Sir Robert Spotfwood and other diftinguifhed loyalifts. The town underwent a fiege in 1337; when poffeffed by the Engliffi, and other part partizans of Baliol; but the loyalifts, under the Earls of March and Fife, made themfelves maffers of it in 3 weeks, by the help of their battering machines.

(3.) ANDREW'S, ST, ANCIENT BUILDINGS OF. The cathedral of St Andrew's was founded by Bifhop Arnold in 1161, but did not attain its full magnificence till 1318. Its length from E. to W. was 370 feet; that of the tranfcept, 322. But though this vaft pile was 157 years in building, in June 1559, it was demolifhed in a fingle day; and fo effectually has it been deftroyed, that nothing now remains but part of the eaft and weft ends, and of the fouth fide. It is cuftomary, for modern hiftorians, in writing of fuch tranfactions, to throw the blame of the popular fury, exerted on thofe occafions, on our firft reformers; but, whether the charge is ftrictly juft or not, the philanthropift, who reflects on the monftrous tyranny that provoked the outrages on the one hand, and the happy confequences that have flowed from the reformation on the other, will think the lofs of a magnificent building nothing in comparifon. Near the eaft end of the chapel of St Regulus; the tower of which is a lofty equilateral triangle, of 20 feet each fide, and 103 feet high; the body of the chapel remains, but the two fide chapels are ruined. The arches of the windows and door are round, and fome even more than femicircles; an undoubted proof of their antiquity. The priory was founded by Alexander I. in 1122; and the monks, (canons regular of St Auguftine,) were brought from Scone, in 1140, by Robert, Bifhop of this fee. By an act of parliament, in the time of James I. the prior had precedence of all abbots and priors, and on the days of feftival wore a mitre and others epifcopal ornaments. Dependent on this priory were thofe of Lochleven, Portmoak, Monimufk, the Ifle of May, and Pittenweem, each originally a feat of the Culdees. The revenues of the houfe were immenfe, viz. 2237 l. 2s. 20½d. in money, and above 440 chaldrons of grain and meal: befides the produce of 480 acres of land. Nothing remains of the priory except the walls of the precinct, which fhow its vaft extent. In one part is a moft artlefs gateway, formed only of feven ftones. This inclofure begins near the cathedral, and extends to the fhore. The other religious houfes were, one of Dominicans, founded, in 1274, by Bifhop Wifhart; another of Obfervantines, founded by Bifhop Kennedy, and finifhed by his fucceffor Patrick Graham in 1478; and, according to fome, the Carmelites had a fourth. Immediately above the harbour ftood the collegiate church of Kirkheugh, originally founded by Conftantine III. who retiring from the world, became here a Culdee. From its having been firft built on a rock, it was ftyled. *Præpofitura a Sanctæ* MARIÆ *de rupe*. In the church of St Salvator is a moft beautiful tomb of bifhop Kennedy, who died, an honour to his family, in 1466. The Gothic work is uncommonly elegant. Within the tomb were difcovered fix magnificent maces, which had been concealed here in troublefome times. One was given to each of the other three Scotch univerfities, and three are preferved here. In the top is repreferted our Saviour; around the angels, with the inftruments of the paffion. With thefe are fhown fome filver arrows, with large filver plates affixed to them, on which are infcribed the arms and names of the noble youth, victors in the annual competitions in archery, which were dropt but a few years ago; and the golf fucceeded.

(4.) ANDREW'S, ST, CASTLE OF. The remains of the caftle, are ftill to be feen on the E. fide of

the city, on a rock overlooking the sea. This fortress was founded, in 1401, by Bishop Trail, who was buried in the high altar of the cathedral; and was afterwards the residence of cardinal Beaton; who, after the death of George Wishart, apprehending some danger, caused it to be fortified so strongly as to be at that time deemed impregnable. In this fortress, however, he was surprized and assassinated by Norman Lesly with 15 others. They seized on the gate of the castle early in the morning of May, 29, 1546; it having been left open for the workmen who were finishing the fortifications; and having placed centinels at the door of the cardinal's apartment, they awakened his numerous domestics one by one; and, turning them out of the castle, they without violence, tumult, or offering the smallest injury to any other person, inflicted on Beaton the death he justly merited. The conspirators were immediately besieged in this castle by the regent, earl of Arran; and notwithstanding they had acquired no greater strength than 150 men, they resisted all his efforts for five months. This, however, was owing to the unskilfulness of the besiegers more than to the strength of the place; for, in 1547, the castle was reduced and demolished. The entrance of it is still to be seen; and the window is shown, out of which it is said the cardinal looked, to glut his eyes with the cruel martyrdom of George Wishart, who was burnt on a spot beneath.

(5.) ANDREW'S, ST, EXTENT AND POPULATION OF. St Andrew's is a mile in circuit, and contains three principal streets. On entering the west port, a well built street, straight, and of a vast length and breadth, appears; but so overgrown with grass, and presenting such a dreary solitude, that it conveys the idea of being laid waste by the pestilence. St Andrew's is now greatly reduced in the number of its inhabitants; at present scarcely exceeding 2000. The number when it was the seat of the primate cannot now be ascertained: but during the period of its splendor, there were between 60 and 70 bakers; and now 9 or 10 are sufficient for the place.

(6.) ANDREW'S, ST, TRADE, HARBOUR, &c. OF. The trade of St Andrew's was once very considerable. So late as the reign of Charles I. this place had 30 or 40 trading vessels, and carried on a considerable herring and white fishery, by means of busses, in deep water; which fisheries had for ages been the grand source of their commerce, wealth, and splendor. After the death of the king, this whole coast, and St Andrew's in particular, became a scene of murder, plunder, and rapine: every town suffered in proportion to its magnitude and opulence. Nor were those ruffians satisfied with the shipping, merchandise, plate, cattle, &c. for they also laid the whole coast under contribution. St Andrew's was required to pay 1000l. but the inhabitants not being able to raise that sum after being thus plundered, the general compounded for 500l. which was raised by a loan at interest, and hath remained a burden upon the corporation, it is said ever since. The harbour is artificial, guarded by piers, with a narrow entrance, to give shelter to vessels from the violence of a very heavy sea, by the encroachments of which it has suffered much. Whatever manufactures this city might in former times possess, that of golf-balls is now the chief; which, trifling as it may seem, maintains a great number of people. St Andrew's, however, has 4 annual fairs, viz. on the 2d Thurs. in April, 1st Tuesd. in July, 1st Aug. 29th Sept. and on *St Andrew's day*, all O. S. and a weekly market on Thursday.

(7.) ANDREW'S, ST, UNIVERSITY OF. The celebrated university of this city was founded in 1411, by bishop Wardlaw; and the next year he obtained from Benedict III. the bull of confirmation. It consisted once of 3 colleges. 1. St Salvator's, founded in 1458, by bishop Kennedy.—This is a handsome building, with a court or quadrangle within: on one side is the church, on another the library; the third contains apartments for students; the fourth is unfinished. 2. St Leonard's College was founded by prior Hepburn, in 1522. This is now united with the last, and the buildings sold, and converted into private houses. 3. The new, or St Mary's college, was established by Abp. Hamilton in 1553; but the house was built by James and David Bethune, or Beaton, who did not live to complete it. This is said to have been the seat of a *schola illustris* long before the establishment even of the university; where several eminent clergymen taught, gratis, the sciences and languages. But it was called the *new college*, because of its late erection into a divinity college by the abp. The university is governed by a chancellor, an office originally designed to be perpetually vested in the abps. of St Andrew's; but since the reformation, he is elected by the 2 principals, and the professors of both the colleges. The rector is the next great officer to whose care is committed the privileges, discipline, and statutes of the university. The colleges have their rectors, and professors of different sciences, who are indefatigable in their attention to the instruction of the students, and to that of essential article their morals. This place possesses several very great advantages respecting the education of youth. The air is pure and salubrious; the place for exercise, dry and extensive; the exercises themselves are healthy and innocent. The university is fixed in a peninsulated country; remote from all commerce with the world, which in great towns prove the haunt of dissipation.—From the smallness of the society every student's character is perfectly known. No little irregularity can be committed, but it is instantly discovered and checked; vice cannot attain a height in this place, for the incorrigible are never permitted to remain the corrupters of the rest. A printing office was established here for the convenience of the university, in 1795; and very correct and elegant editions of several classics were printed under the care of Mr John Hunter.

ANDREW'S, ST, is also the name of several other places; viz. 1 and 2, an island and town in Dalmatia: 3 and 4, an island and town in Hungary: 5, a small but flourishing town in Nova Scotia: and 6, a village in Suffolk near Beccles.

ANDREZE, a town of France, in the department of Indre and Loire.

ANDRI. See ANDROS.

(1.) ANDRIA, a city and a bishop's see in the territory of Bari, in the kingdom of Naples.

pretty large, well peopled, and ſeated in a ſpacious plain, 4 miles from the Adriatic coaſt, and 10 W. of Barri. Lon. 17. 4. E. Lat. 41. 15. N.

(1.) ANDRIA, in Grecian antiquity, public entertainments firſt inſtituted by Minos of Crete, and after his example, appointed by Lycurgus in Sparta, at which a whole city or a tribe aſſiſted. They were managed with great frugality, and perſons of all ages were admitted, the younger only being obliged by the lawgiver to repair thither to ſchool's of temperance and ſobriety.

ANDRIA, is alſo uſed by ſome naturaliſts to denote a ſpecies of hermaphrodite, wherein the male ſex hath the predominancy.

ANDRIANS, the inhabitants of the iſland, Andros, which ſee, § 2, & 3.

ANDRION, the hall, or place of eating, where public entertainments were held in Crete, the uppermoſt part of which was always a table apart for ſtrangers.

ANDRISCUS, a man of mean extraction, who, pretending to be the ſon of Perſeus laſt king of Macedonia, took the name of Philip, for which reaſon he was called *Pſeudo-Philippus*, the *Falſe Philip*. After a complete victory over Juventus, the Roman Prætor, he aſſumed the kingly power, but exerciſed it with vaſt cruelty. At laſt, the Romans obliged him to fly into Thrace, where he was betrayed and delivered into the hands of Metellus, whoſe triumph he ſerved to grace, walking in chains before him.

ANDROAS, or ANDRODAMAS, among ancient naturaliſts, a kind of pyritæ, to which they attributed certain magical virtues.

ANDROCLIDES, a Lacedæmonian hero, who, refuſing to go to the war, and being deſpiſed because he was lame, replied, the army had need of ſuch as would *fly*, and not of thoſe that might run away.

ANDRODAS, in ancient writers, the 63d year of a man's life; called alſo *annus Egyptius*, and *annus magnus*, or the great climacteric.

ANDROGEUS, in fabulous hiſtory, the ſon of Minos king of Crete, was murdered by the youth of Athens and Megara, who envied his being always victor at the Attic games. But Minos having taken theſe towns, obliged the inhabitants to ſend him an annual tribute of ſeven young men and as many virgins, to be devoured by the Minotaur; from which tribute Theſeus delivered them, by killing the monſter.

ANDROGYNA, in botany, plants bearing male and female flowers on the ſame root.

* ANDROGYNAL. *adj.* [from ανηρ and γυνη.] Having two ſexes; hermaphroditical.

* ANDROGYNALLY. *v. a.* [from *androgynal*.] In the form of hermaphrodites; with two ſexes.—The examples hereof have undergone no change or new tranſexion, but were *androgynally* born and under ſome kind of hermaphrodites. *Brown.*

(2.) ANDROGYNES, in natural hiſtory, a name given to thoſe human creatures which, by a monſtrous formation of their generative parts, ſeem (for it is only ſeeming) to unite in themſelves the two ſexes, that of the male and of the female. This *luſus naturæ*, this defect, or rather redundancy, in the animal ſtructure, is deſcribed by medical authors in the following manner: "There is a depravation in the ſtructure of the parts intended by nature for propagation, when, beſides thoſe concealed parts that are found neceſſary for the diſcharge of prolific functions, the *pudenda* of the other ſex likewiſe appear. This monſtrous production of nature is diverſified in 4 different ways; of which three appear in males and one in females. In men, the female pudendum, cloathed with hair, ſometimes appears contiguous to the perinæum; at other times, in the middle of the ſcrotum; at other times, which conſtitutes the 3d diverſity, through that part itſelf which in the midſt of the ſcrotum exhibits the form of a pudendum, urine is emitted. Near that part which is the teſt of puberty, and above the pudendum, even in females, the maſculine genitals appear in ſome, conſpicuous in all their three forms, one reſembling the *viretram* or yard, the other the two teſticles: but for the moſt part it happens, that, of the two inſtruments of generation, one is feeble and inert; and it is extremely rare that both are found ſufficiently valid and proper for feats of love; nay, even in a great many, both theſe members are deficient and impotent, ſo that they can perform the office neither of a male nor of a female."

(2.) ANDROGYNES, REFLECTIONS UPON. With reſpect to them it appears, from a collation of all the circumſtances which have been obſerved by naturaliſts worthy of credit, that there is no ſuch thing as a perfect *androgyne*, or real hermaphrodite; that is to ſay, a human creature which, by its unnatural, or rather preternatural ſtructure, poſſeſſes the genuine power of both ſexes, in ſuch a manner as to be qualified for performing the functions of both with ſucceſs: the irregularity of their fabrication almoſt always conſiſts in ſomething ſuperfluous added to one of the two ſexes, which gives it the appearance of the other, without beſtowing the real and characteriſtical diſtinction; and every *hermaphrodite* is almoſt always a very woman. Since this monſtrous exhibition of nature is not ſuch as to abrogate the rights or deſtroy the character of humanity amongſt human beings, this involuntary misfortune implies no right to deprive thoſe, upon whom it is inflicted by nature, of the privileges natural to every citizen; and as this deficiency is no more infectious than any other corporeal mutilation, it is not eaſy to ſee why marriage ſhould be prohibited to one of theſe unhappy beings, merely on account of its equivocal appearance, which acts in the character of its prevailing ſex. If ſuch a creature, by the defect of its conſtruction, ſhould be barren: this does not infer any right of diſſolving the marriage which it may have contracted, more than the ſame ſterility proceeding from any cauſe whether known or unknown, if his or her conſort ſhould not on that account require a divorce. It is only the licentious abuſe either of one or the other ſex which can be ſubjected to the animadverſion of the police. See HERMAPHRODITE. Such are the ſentiments of the authors of the French Encyclopédie. To theſe it has been objected, that "from ſuch heterogeneous matches nature ſeems to recoil with innate and inextinguiſhable horror; and that none of theſe invincible averſions are implanted in our frame, without a final cauſe worthy of its Author."

Hence they infer, that "the law ſhould interfere, as nature revolts againſt ſuch horrible conjunctions." In anſwer to this, it might be ſufficient to obſerve, that there are many unaccountable and invincible averſions implanted in the frame of particular individuals, the purpoſe of which ſeems quite inexplicable; ſuch as for inſtance, the averſion that ſome people of weak nerves feel at the ſight of a cat; but where no ſuch antipathy takes place, and more eſpecially, if the adrogyne is ſo perfect in one ſex as to be prolific, we cannot ſee either juſtice or humanity in propoſing a divorce; or in calling in the aid of the police to puniſh as a *crime*, what is at worſt only a *misfortune*. Inſtances of androgynes, we believe, occur very rarely; but, where they do occur, the mother of ſuch an individual ſhould inſtruct *it*, when it arrives at the period of puberty, to be candid with any lover who ſeriouſly propoſes marriage, and inform ſuch a perſon before hand, of the defect or redundancy under which it labours; and then, if the lover's affection is ſo ſtrong as to get over this difficulty, there can be no cauſe for complaint afterwards; and the parties may live happily together. An honeſt declaration of this kind is the only antidote that juſtice and humanity can preſcribe, againſt the evils otherwiſe to be dreaded by an androgyne after marriage.

(3.) ANDROGYNES, in the mythology, creatures of whom, according to the fable, each individual poſſeſſed the powers and characters of both ſexes, having two heads, four arms, and two feet. The rabbinical writers pretend, that Adam was created double, one body being male, the other female, which in their origin not being eſſentially joined, God afterwards did nothing but ſeparate them. Plato adopts the ſame idea in his *Banquet*, and ſays, the gods originally formed man with two bodies and two ſexes; but that being alſo endowed with a gigantic force man became inſolent and made war againſt the gods. Jupiter, exaſperated, debilitated this double being, by diſjoining the male from the female, and leaving each half to ſubſiſt with its own powers alone.—This fable of Plato has been uſed with great ingenuity by a modern French poet, who attributes the propenſity which attracts one of the ſexes towards the other, to the natural ardour which each half of the *androgynes* feel for re-union; and their inconſtancy, to the difficulty which each of the ſeparated parts encounters, in its efforts to recover its proper and original half. If a woman appears to us amiable, we inſtantly imagine her to be that moiety with whom we ſhould only have conſtituted one whole, had it not been for the fault of our original double ſexed progenitor,

* ANDROGYNUS. *adj.* The ſame with *androgynal*.

ANDROGYNOUS, in botany. See ANDROGYNA.

ANDROGYNUM, in eccleſiaſtical writers, is uſed to denote *matrimony*, or even one of the parties married.

ANDROGYNUM BALNEUM, denotes a bath common to both ſexes.

(1.) * ANDROGYNUS. *n. ſ.* [See ANDROGYNAL.] An hermaphrodite; one that is of both ſexes.

(2.) ANDROGYNUS, in aſtrology, planets which are ſometimes hot, and ſometimes cold: thus Mercury, when near the ſun, is reputed hot and dry by aſtrologers; and when near the moon, cold and moiſt.

(1.) ANDROIDES, [from ἀνὴρ, a man, and εἶδος, form,] in mechanics, a human figure, which by certain ſprings or other movements, is capable of performing ſome of the natural motions of a living man. The motions of the human body are more complicated, and conſequently more difficult to be imitated, than thoſe of any other creature; whence the conſtruction of an *androides*, in ſuch a manner as to imitate any of theſe actions with tolerable exactneſs, is juſtly ſuppoſed to indicate a greater ſkill in mechanics than any other piece of workmanſhip whatever. A very remarkable figure of this kind appeared in Paris, in the year 1738. It repreſented a flute player, and was capable of performing many different pieces of muſic on the German flute; which, conſidering the difficulty of blowing that inſtrument, the different contractions of the lips neceſſary to produce the diſtinctions between the high and low notes, and the complicated motions of the fingers, muſt appear truly wonderful. This machine was the invention of M. Vaucanſon, member of the Royal Academy of Sciences; and a particular deſcription of it was publiſhed in the Memoirs of the Academy for that year.

(2.) ANDROIDES, AN EXTRAORDINARY, DESCRIBED. The figure itſelf was about five feet and an half in height, ſituated at the end of an artificial rock, and placed upon a ſquare pedeſtal four feet and a half high and three and a half broad. The air entered the body by three pipes ſeparated one from another. It was conveyed to them by 9 pair of bellows, three of which were placed above and ſix below. Theſe were made to expand and contract regularly in ſucceſſion, by means of an axis of ſteel turned round by ſome clock-work. On this axis were different protuberances at proper diſtances, to which were fixed cords thrown over pullies, and terminating in the upper boards of the bellows, ſo that, as the axis turned, theſe boards were alternately raiſed and let down. A contrivance was alſo uſed to prevent the diſagreeable hiſſing fluttering noiſe uſually attending the motion of bellows. This was by making the cord, by which the bellows was moved, preſs, in its deſcent, upon one end of a ſmaller lever, the other end of which aſcending forced open the ſmall leathern valve that admitted the air, and kept it ſo, till, the cord being relaxed by the deſcent of the upper board, the lever fell, and the air was forced out. Thus the bellows performing their functions conſtantly without the leaſt hiſſing or other noiſe by which it could be judged in what manner the air was conveyed to the machine. The upper boards of three of the pairs of bellows were preſſed down by a weight of four pounds, that of 3 others by a weight of 2 pounds, and thoſe of the three remaining ones by nothing but their own weight. The three tubes by which the air entered, terminated in three ſmall reſervoirs in the trunk of the figure. There they united, and aſcending towards the throat, formed the cavity of

of the mouth, which terminated in two ſmall lips adapted in ſome meaſure to perform their proper functions. Within this cavity alſo was a ſmall moveable tongue; which by its play, at proper periods, admitted the air, or intercepted its paſſage to the flute. The fingers, lips, and tongue, received their proper directions by means of a ſteel cylinder turned by clock-work. It was divided into 15 equal parts, which, by means of pegs, preſſing upon the ends of 15 different levers, cauſed the other extremities to aſcend. Seven of theſe levers directed the fingers, having wires and chains affixed to their aſcending extremities, which being attached to the fingers, cauſed them aſcend in proportion as the other extremity was preſſed down by the motion of the cylinder, and *vice verſa*. Thus the aſcent or deſcent of one end of a lever, produced a ſimilar aſcent or deſcent in the correſponding finger, by which one of the holes of the flute was occaſionally opened or ſtopped, as by a living performer. Three of the levers ſerved to regulate the ingreſs of the air, being contrived ſo as to open and ſhut, by means of valves, and three reſervoirs of air above mentioned, ſo that more or leſs ſtrength might be given, and a higher or lower note produced, as occaſion required. The lips were, by a ſimilar mechaniſm, directed by four levers, one of which opened them, to give the air a freer paſſage; the other contracted them; the third drew them backward; and the fourth puſhed them forward. The lips were projected upon that part of the flute which receives the air; and, by the different motions already mentioned, modified the tone in a proper manner.—The remaining lever was employed in the direction of the tongue, which it eaſily moved ſo as to ſhut or open the mouth of the flute. Thus we ſee how all the motions neceſſary for a German flute-player could be performed by this machine; but a conſiderable difficulty ſtill remains, namely, how to regulate theſe motions properly, and make each of them follow in juſt ſucceſſion. This, however, was effected by the following ſimple method. The extremity of the axis of the cylinder was terminated on the right ſide by an endleſs ſcrew, conſiſting of 12 threads, each placed at the diſtance of a line and a half from the other. Above this ſcrew was fixed a piece of copper, and in a ſteel pivot, which, falling in between the threads and the ſcrew, obliged the cylinder to follow the threads, and, inſtead of turning directly round, it was continually puſhed to one ſide. Hence, if a lever was moved by a peg placed on the cylinder, in any one revolution, it could not be moved by the ſame peg in the ſucceeding revolution, becauſe the peg would be moved a line and an half beyond it by the lateral motion of the cylinder. Thus, by an artificial diſpoſition of theſe pegs in different parts of the cylinder, the tune was made, by the ſucceſſive elevation of the proper levers, to exhibit all the different motions of a flute-player, to the admiration of every one who ſaw it.

(3.) ANDROIDES, M. DE KEMPELEN'S, DESCRIBED. The conſtruction of machines capable of imitating even the mechanical actions of the human body, ſhew exquiſite ſkill; but what ſhall we ſay of one capable, not only of imitating actions of this kind, but of acting as external circumſtances require, as though it were endowed with life and reaſon? This, nevertheleſs, has been done. M. de Kempelen, a gentleman of Preſburg in Hungary, excited by the performances of M. de Vaucanſon, at firſt endeavoured to imitate them, and at laſt far excelled them. This gentleman conſtructed an Androides capable of playing at cheſs!—Every one who is in the leaſt acquainted with this game muſt know, that it is ſo far from being mechanically performed, as to require a greater exertion of the judgment and rational faculties than is ſufficient to accompliſh many matters of greater importance. An attempt, therefore, to make a wooden cheſs-player, muſt appear as ridiculous as to make a wooden preacher or counſellor of ſtate. That this machine really was made, however, the public have had ocular demonſtration. The inventor came over to Britain in 1783, where he remained above a year with his automaton. It is a figure as large as life, in a Turkiſh dreſs, ſitting behind a table, with doors of three feet and a half in length, two in depth, and two and a half in height. The chair on which it ſits is fixed to the table, which runs on four wheels. The automaton leans its right arm on the table, and in its left hand holds a pipe: with this hand it plays after the pipe is removed. A cheſs-board of 18 inches is fixed before it. This table, or rather cupboard, contains wheels, levers, cylinders, and other pieces of mechaniſm, all which are publicly diſplayed. The veſtments of the automaton are then lifted over its head, and the body is ſeen full of ſimilar wheels and levers. There is a little door in its thigh, which is likewiſe opened; and with this, and the table alſo open, and the automaton uncovered, the whole is wheeled about the room. The doors are then ſhut, and the automaton is ready to play; and it always takes the firſt move. At every motion the wheels are heard, the image moves its head, and looks over every part of the cheſs-board. When it checks the queen, it ſhakes its head twice, and thrice in giving check to the king. It likewiſe ſhakes its head when a falſe move is made, replaces the piece, and makes its own move; by which means the adverſary loſes one. Mr de Kempelen remarks, as the moſt ſurpriſing circumſtance attending this automaton, that it had been exhibited at Preſburg, Vienna, Paris, and London, to thouſands, many of whom were mathematicians and cheſs-players, and yet the ſecret by which he governed the motion of its arm was never diſcovered. He prided himſelf ſolely on the conſtruction of the mechanical powers, by which the arm could perform 10 or 12 moves. It then requires to be wound up like a watch, after which it was capable of continuing the ſame number of motions. The automaton could not play unleſs Mr de Kempelen or his ſubſtitute was near it to direct its moves. A ſmall ſquare box, during the game, was frequently conſulted by the exhibiter; and herein conſiſted the ſecret, which he ſaid he could in a moment communicate. He who could beat Mr de Kempelen was, of courſe, certain of conquering the automaton. It was made in 1769. His own account of it was, "C'eſt une bagatelle qui n'eſt pas ſans merite du cote du mechaniſme, mais les effets n'en paroiſſent

paroiſſent ſi merveilleux que par la hardieſſe de Pidee, & par l'heureux chioz des moyens employs pour faire illuſion." The ſtrongeſt and beſt armed loadſtone was allowed to be placed on the machine by any of the ſpectators. As the inventor of this admirable piece of mechaniſm has not yet thought proper to communicate to the public the means by which it is actuated, it is in vain for any, except thoſe who are exquiſitely ſkilled in mechanics, to form conjectures concerning them. —Many other curious imitations of the human body, as well as of other animals, have been exhibited, though none of them equal to the laſt mentioned one. See AUTOMATON.

ANDROLEPSY, in Grecian antiquity, an action allowed by the Athenians againſt ſuch as protected perſons guilty of murder. The relations of the deceaſed were empowered to ſeize 3 men in the city or houſe whither the malefactor had fled, till he was either ſurrendered, or ſatisfaction made ſome way or other for the murder. The word is, therefore, uſed for repriſals.

ANDROMACHE, the wife of the valiant Hector, the mother of Aſtyanax, and daughter of Eetion king of Thebes in Cilicia. After the death of Hector and the deſtruction of Troy, ſhe married Pyrrhus; who afterwards gave her to Helenus the ſon of Priam, with part of Epirus.

ANDROMACHI *theriaca*, or *treacle of* ANDROMACHUS, in pharmacy, is a capital alexipharmic compoſition; called alſo Venice treacle.

(I.) ANDROMEDA, in aſtronomy, a northern conſtellation, behind Pegaſus, Caſſiopeia, and Perſeus. It repreſents the figure of a woman chained. The ſtars in this conſtellation, in Ptolemy's catalogue, are 23, in Tycho's 22, in Bayer's 27, in Mr Flamſtead's no leſs than 84.

(II.) ANDROMEDA, in botany, the MARSH CYSTUS: A genus of the monogynia order, belonging to the decandria claſs of plants, and in the natural method ranking under the 18th order, bicornes. The characters are: The calyx is a quinquepartite perianthium, ſmall, coloured, and perſiſtent: The corolla is monopetalous, campanulated, and quinquefid, with reflected diviſions: The ſtamina conſiſt of ten ſubulated filaments, ſhorter than the corolla; the antheræ two horned and nodding: The piſtillum has a roundiſh germen; a cylindric ſtylus larger than the ſtamina, and perſiſtent: and an obtuſe ſtigma: The pericarpium is a roundiſh five cornered capſule, with five cells and five valves: The ſeeds are very numerous, roundiſh, and gloſſy. There are 15 ſpecies, of which the following are the principal.

(1.) ANDROMEDA ARBOREA is a native of Virginia and Carolina, where it is called the ſorrel tree. It grows to the height of 20 feet, with a trunk uſually 5 or 6 inches thick. The branches are ſlender, thick ſet with leaves, like thoſe of the pear tree. From the ends of the branches proceed many ſlender ſtalks, on the one ſide of which hang many ſmall white flowers, like thoſe of the ſtrawberry plant. This ſpecies ſhould be kept from froſt in winter, and often watered in ſummer.

(2.) ANDROMEDA CALYCULATA, is a native of Siberia, and likewiſe of North America. It grows on moſſy land, and is therefore very difficult to keep in gardens. The leaves are ſhaped like thoſe of the box tree, and are of the ſame conſiſtence, having ſeveral ſmall punctures on them. The flowers grow in ſhort ſpikes, from the extremity of the branches. They are produced ſingle, between two leaves, are of a white colour, and a cylindrical or pitcher like ſhape.

(3.) ANDROMEDA MARIANA, a native of North America, is a low ſhrub, ſending out many woody ſtalks from the root, which are garniſhed with oval leaves, placed alternately; the flowers are collected in ſmall bunches, are of an herbaceous colour, and ſhaped like thoſe of the ſtrawberry tree. They appear in June and July.

(4.) ANDROMEDA PANICULATA, is a native of Virginia and Carolina, growing in moiſt places. The plants uſually arrive at the height of 10 feet, with thin leaves ſet alternately, and having their edges finely ſerrated. The flowers are tubulous, ſmall, and of a greeniſh white, cloſely ſet horizontally on one ſide of the ſlender ſtalks. Theſe flowers are ſucceeded by berries, which open when ripe; and divide into five ſections, including many ſmall ſeeds.

(5.) ANDROMEDA POLIFOLIA is a low plant, growing naturally in bogs in the northern countries. It is not eaſily preſerved in gardens; and, being a plant of no great beauty, is ſeldom cultivated. Theſe four laſt ſpecies are hardy plants. They ſucceed beſt, however, upon boggy and moiſt grounds. The ſeeds muſt be procured from the places where they grow naturally; a year before which, the moiſteſt part of the garden ſhould be dug, and the roots of all weeds cleared off. As the weeds begin to riſe, the ground ſhould be again dug, and ſea or drift ſand ſhould be plentifully mixed with the natural ſoil. The ground being made tolerably fine, the ſeeds ſhould be ſown very ſhallow in the boggy land; or if the land ſhould be ſo boggy that it cannot be eaſily worked, to be proper for the reception of the ſeeds, then let a ſufficient quantity of ſoil from freſh paſture, mixed with drift ſand, be laid over the bog, and the ſeeds ſown therein. The bog will in time abſorb this ſoil, but the ſeeds will come up; and this is the moſt effectual method of procuring plants of this kind from ſeeds. The firſt year after they come up, they ſhould be ſhaded in very hot weather; after which, they will require little or no care.—Another method of increaſing theſe ſhrubs is by layers or ſuckers. Theſe ſhould be planted in a boggy ſituation, and in a very little time they will increaſe; for they throw out ſuckers in prodigious plenty, and, the ſituation ſuit them, to a great diſtance. They may be taken off, and planted where they are to remain.

(III.) ANDROMEDA, in mythology, the daughter of Cepheris and Caſſiopeia, and wife of Perſeus. Minerva tranſlated her into the heavens.

(IV.) ANDROMEDA, in poetry, the name of a celebrated tragedy of Euripides, admired by the ancients, above all the other compoſitions of that poet, but now loſt. It was the repreſentation of this play, in a hot ſummer day, that occaſioned that epidemic fever, or phrenzy, for which the Abderites are often mentioned. See ABDERA.

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(V.) ANDROMEDA, in writers of the middle age, a kind of garment made of ram skins.

ANDRON, in Grecian antiquity, denotes the apartment in houſes deſigned for the uſe of men; in which ſenſe it ſtands oppoſed to *Gynæceum*.—The Greeks alſo gave their dining rooms the title of *andron*, becauſe the men alone feaſted there.

(1.) ANDRONA, in antiquity, a ſtreet, or public place, where people met and converſed together. In ſome writers, *androna* is more expreſsly uſed for the ſpace between two houſes; in which ſenſe, the Greeks alſo uſe the term ἀδελφεὰς, for the way or paſſage between two apartments.

(2.) ANDRONA, in eccleſiaſtical writers, that part in churches deſtined for the men. Anciently men and women had ſeparate apartments in places of worſhip, where they performed their devotions aſunder; which method is ſtill religiouſly obſerved in the Greek church. The ἀνδρὼν, or *androna* was on the ſouthern ſide of the church, and the women's apartment on the northern.

ANDRONICUS I. Comnenus, emperor of the Eaſt, was the Son of Iſaac, and grandſon of Alexis Comnenus. He was vigorous of body, ſteady of mind, active, martial, and eloquent; but he had alſo many vices. The emperor Manuel, who was his couſin, gave him a conſiderable command in Cilicia: but he was diſcovered in a treaſonable correſpondence with Germany and Hungary, and thrown into priſon, where he continued 12 years. From this he eſcaped to Ruſſia, and engaged the Ruſſian prince to join his troops with thoſe of Manuel, in the invaſion of Hungary. By this artifice he obtained a free pardon; but he ſoon after incurred diſpleaſure, which was increaſed by various intrigues till Manuel's death, in 1163, and the acceſſion of his ſon Alexis II. who, being quite a youth, Andronicus got himſelf choſen partner in the government. The innocent Alexis ſoon fell a ſacrifice to his coadjutor's thirſt of power, but he had ſcarce reigned two years, when the people, exaſperated at his cruelties, proclaimed Iſaac Angelus emperor, put Andronicus in irons, thruſt out his eyes, led him through the city in an ignominious manner; and at laſt ſtabbed him, calling out for mercy, in 1185, aged 73.

ANDRONICUS II. emperor of Conſtantinople, ſucceeded Michael VIII. in 1291, and had different battles with Othoman, emperor of the Turks. He died in 1332.

ANDRONICUS III. ſucceeded Andronicus II. in 1332; and, after a ſhort and troubleſome reign of 9 years, died in 1341.

ANDRONICUS of Cyrrhus, built at Athens, an octagon tower, with figures carved on each ſide, repreſenting the 8 principal winds. A braſs triton at the ſummit, with a rod in its hand, which turned with the wind, pointed to the quarter, whence it blew. From this model is derived the cuſtom of placing weathercocks on ſteeples.

ANDRONICUS, of Rhodes, a peripatetic philoſopher who flouriſhed B. C. 63, to whom we are indebted for reſtoring and publiſhing the works of Ariſtotle, in the time of Sylla. He alſo wrote commentaries on ſome of that philoſopher's works.

ANDRONION, in phyſic, the name of a paſte invented by an ancient phyſician, named Andro, ſaid to have been of great efficacy againſt the carbuncle and herpes. Its ingredients, according to Æginetа's preſcription, are the *ſquamæ* of copper, *æs uſtum*, *ſal ammoniac*, *alumen rotundum*, ſhavings of verdigriſe, and frankincenſe, all wrought up with wine. Celſus gives another recipe, and Aetius a third.

ANDROPHAGI, (from ἀνὴρ, a man, and φαγω, I eat,) a nation of cannibals, whoſe country, according to Herodotus, was adjacent to Sythia. They are repreſented, as the moſt barbarous and fierce of all nations. They were not governed by laws; the care of their cattle was their chief employment. Their dreſs was like that of the Scythian's; and they had a language, peculiar to themſelves. See ANTHROPOPHAGI.

ANDROPOGON, or MAN'S-BEARD, in botany: a genus of the monœcia order, belonging to the polygamia claſs; and in the natural method ranking under the 4th order, Gramina. The hermaphrodite calyx is a one-flowered bivalved glume: The corolla is a bivalved glume awn'd at the baſe: The ſtamina conſiſt of three capillary filaments; the antheræ are oblong and bifurcated: The piſtillum has an oval germen; with two capillary ſtyli coaleſced, and villous ſtigmata: There is no pericarpium: The ſeed is one, ſolitary, and covered. The male calyx, corolla, and ſtamina, the ſame with the hermaphrodite: but the corolla without the awn.—There are above 18 ſpecies. Of theſe the moſt remarkable is

ANDROPOGON NARDUS, which produces the Indian nard, or ſpikenard of the ſhops. The ſpikenard, as brought from the Eaſt Indies, is a congeries of ſmall fibres iſſuing from one head, and matted cloſe together, ſo as to form a bunch about the ſize of the finger, ſome ſmall ſtrings at the oppoſite end of the head. The matted fibres (which are the parts choſen for medicinal purpoſes) are ſuppoſed by ſome to be the head or ſpike of the plant, by others the root: they ſeem rather to be the remains of the withered ſtalks, or ribs of the leaves; ſometimes entire leaves and pieces of ſtalks are found among them: we likewiſe now and then meet with a number of theſe bunches iſſuing from one root. Spikenard has a warm, pungent, bitteriſh taſte; and a ſtrong, not very agreeable ſmell. It is ſtomachic and carminative; and ſaid to be alexipharmic, diuretic, and emmenagogue; but is now little employed.

(1.) ANDROS, an iſland lying between Tenedos and Euboea; being one mile diſtant from the former, and ten from the latter. It is one of the ancient Cyclades. The ancients gave it various names, viz. Cauros, Lalia, Nonagria, Epagris, Atandros, and Hydruſia. The name of *Andros* it received from one Andreus, appointed, according to Diodorus Siculus, by Rhadamanthus, one of the generals, to govern the Cyclades, after they had of their own accord ſubmitted to him. As to the name of *Antandros*, the ſame author tells us, that Aſcanius the ſon of Æneas, being taken priſoner by the Pelaſgians, gave them this iſland for his ranſom, which on that account was called *Antandros*, or "delivered for one man." The name of *Hydruſſa* it obtained in common with other places well ſupplied with water. It had formerly

merly a city of great note, bearing the same name and situated very advantageously on the brow of an hill, which commanded the whole coast. In this city, according to Strabo and Pliny, stood a famous temple dedicated to Bacchus. Near this temple, Mutianus, as quoted by Pliny, tells us, there was a spring called the *gift of Jupiter*; the water of which had the taste of wine in the month of January, during the feasts of Bacchus, which lasted seven days. The same author adds, that the waters, if carried to a place whence the temple could not be seen, lost their miraculous taste. Pausanias makes no mention of this spring; but says, that during the feast of Bacchus, wine flowed, or was at least by the Andrians believed to flow, from the temple of that god. The priests, no doubt, found their account in keeping up this belief, by conveying, through secret conduits, a great quantity of wine into the temple.

(2.) ANDROS, HISTORY OF. The Andrians were the first of all the islanders who joined the Persians at the time Xerxes invaded Greece; and therefore Themistocles, after the victory at Salamis, resolved to attack the city of Andros, and oblige the inhabitants to pay large contributions for the maintenance of his fleet. Having landed his men on the island, he sent heralds to the magistrates, acquainting them that the Athenians were coming against them with two powerful divinities, *persuasion* and *force*: and therefore they must part with their money by fair means or foul. The Andrians replied, that they likewise had two mighty deities who were very fond of their island viz. *poverty* and *impossibility*; and therefore could give no money. Themistocles, not satisfied with this answer, laid siege to the town; which he probably made himself master of and destroyed, as we are informed by Plutarch. that Pericles, a few years after, sent thither a colony of 250 Athenians. It was, however, soon retaken by the Persians; and, on the overthrow of that empire by Alexander the Great, submitted to him, along with the other islands. On his death it sided with Antigonus, who was driven out by Ptolemy, by whose successors it was held till Attalus, king of Pergamus, besieged the metropolis at the head of a Roman army; and, having taken it, was by them put in possession of the whole island. When Attalus, died the republic claimed this island, with his other, dominions in virtue of his last will.

(3.) ANDROS, PRESENT STATE OF. Andros is now subject to the Turks; and contains a town of the same name, with a great many villages. It is the most fruitful island in the Archipelago, and yields, a great quantity of silk. There are said to be about 6000 inhabitants, besides those of the villages Arni and Amoldeos, who are about two hundred, have a different language and customs, and are called *Albanois*. There are seven monasteries, a great number of churches, and a cathedral for the bishops of the Roman catholic persuasion; but most of the inhabitants are of the Greek communion. The Jesuits had a house and a church in this island; but they were forced to quit them long ago. It has some delightful valleys; but the air is bad, and the water of the city worse. The women would be agreeable enough, if it was not for their dress, which is very unbecoming; for they stuff out their clothes without the least regard to their shape. The peasants make wicker baskets, wherewith they supply the greatest part of the Archipelago. They have all sorts of game in the woods and mountains. Their principal food is goat's flesh; for there is no fish to be met with on their coasts. When they are sick, they are obliged to let the disease take its natural course, having neither physician nor surgeon on the island. A cadi, assisted by a few of the principal persons of the island, has the management of civil affairs, and his residence is in the castle: an aga, who presides over the military force, lives in a tower without the city. About two miles from the present town are still to be seen the ruins of a strong wall with the fragments of many columns, chapiters, bases, broken statues, and several inscriptions, some of which mention the senate and people of Andros, and the priests of Bacchus; from which it is probable that this was the site of the ancient city. Lon. 24. 30. E. Lat. 37. 50. N.

II. ANDROS, in ancient geography, an island in the Irish sea, called *Hedros*, by Ptolemy; now *Bardsey*, or *Birdsey*; distant about a mile from the coast of North Wales.

ANDROSACE, a genus of the monogynia order, belonging to the pentandria class of plants and in the natural method ranking under the 21st order, Preciæ. The essential characters are: The male calyx is five-leaved; the corolla is five petal'd; the stamina are five, inserted on the rudiment of the stylus: The female calyx is five leav'd; the corolla is wanting; the styli are three; the capsule is trilocular; the seeds are two. To this genus Dr Linnæus reckons six species.

1. ANDROSACE CARNEA grows naturally on the Helvetian Mountains, the Alps, and in Styria. They seldom grow more than 3 inches high.

2. ANDROSACE ELONGATA has not been yet particularly described by botanists.

3. ANDROSACE LACTEA, grows on the Alps like the Carnea, and is of the same height.

4. ANDROSACE MAXIMA grows naturally in Austria and Bohemia, among the corn. It has broad leaves, which spread near the ground; from the centre of these the footstalks arise, which are terminated by an umbel of white flowers like those of the auricula. These appear in April and May, and the seeds ripen in June; soon after which the plants perish.

5. ANDROSACE SEPTENTRIONALIS. } These
6. ANDROSACE VILLOSA. } grow

so on the Alps, in Siberia, and the mountains of Switzerland, and do not exceed 3 inches. All these species are propagated by seeds, which should be sown soon after they are ripe, otherwise they seldom come up the same year. If permitted to scatter, they will grow better than when sown.

ANDROSÆMUM, in botany, St John's wort.

* ANDROTOMY. *n. s.* [from ἀνὴρ and τέμνω. The practice of cutting human bodies. *Did.*

ANDROSS, one of the Bermuda Islands.

ANDRUM, a kind of hydrocele, to which the people of Malabar are very subject.—Its origin is derived from the vitious quality of the country water, impregnated with corrosive muriatic salts, the source of most other diseases that infect the Malabarian.

Malabrians. Its ſigns, are an eryſipelas of the ſcrotum, returning every new moon, by which the lymphatics, being eroded, pour a ſerous ſaline humour into the cavity of the ſcrotum. The andrum is incurable; thoſe once ſeized with it have it for life: but it is not dangerous, nor very troubleſome, to thoſe uſed to it; though ſometimes it degenerates into an hydroſarcocele. The method of prevention is by a heap of ſand fetched from a river of the province Mangatti, and ſtrowed in the wells. This is practiſed by the rich. The cure is only palliative, viz. by drawing off the water from the ſcrotum, once a month.

ANDRY, Nicholas, a French phyſician, born at Lyons in 1658. He acquired a profeſſorſhip in the royal college, and roſe to be dean of the faculty of medicine. He died in 1742, aged 84. He wrote, 1. A treatiſe on the generation of worms in the human body: 2. Orthopædia, or the art of correcting deformities in children: 3. On Phlebotomy.

ANDRYALA, DOWNY SOW-THISTLE: A genus of the polygamia æqualis order, belonging to the ſyngenſia claſs of plants; and in the natural method ranking under the 49th order, compoſitæ ſemiflosculus. The eſſential characters are: The receptacle is villous; the calyx is many parted, ſubequal, and rounded; and the pappus is ſimple and ſeſſile. The ſpecies are,

1. ANDRYALA INTEGRIFOLIA is an annual plant, growing naturally in the ſouth of France, Spain, and Italy. It riſes to the height of a foot and an half, with wholly branching ſtalks. The flowers are produced in ſmall cluſters at the top of the ſtalks. They are yellow, and like thoſe of the ſow-thiſtle, ſo make little appearance.

2. ANDRYALA LANATA is a native of Sicily and of the country round Montpelier. The lower leaves are indented and woolly, but thoſe on the ſtalks are entire. It ſeldom riſes more than a foot, ſupporting a few yellow flowers at top.

3. ANDRYALA RAGUSINA is a native of the Cape of Good Hope. The leaves are extremely white, and much indented on their edges. The flower-ſtalks grow about a foot high, having ſmall cluſters of yellow flowers, which appear in July. The ſeeds ſometimes ripen in Britain, but not always.

4. ANDRYALA SINUATA grows in Spain and Portugal; the leaves are broader, longer, and more downy, than either of the other ſorts; the flower-ſtalks riſing more than a foot high. They branch into ſeveral foot-ſtalks, each ſuſtaining one large yellow flower, ſhaped like thoſe of hawkweed, which are ſucceeded by oblong black ſeeds covered with down. All theſe plants are eaſily propagated by ſeeds, which ſhould be ſown in autumn, where they are to remain, and will require no other culture than to thin them where they are too cloſe, and to keep them free from weeds. The 2d ſort muſt have a light dry ſoil, or it will not live in this country.

ANDRZEIOW, a ſmall town in Cracow.

ANDST, a diſtrict in N. Jutland.

ANDUJAR, or } a large and populous city of
ANDUXAR, } Andaluſia, in Spain, ſeated on the Guadalquiver, 25 m. E. of Cordova. It is indifferently rich, and defended by a good caſtle. It is adorned with handſome churches and ſeveral religious houſes, and inhabited by many families of high rank. The land about it abounds in corn, wine, oil, honey, and fruit of all ſorts; and the inhabitants carry on a conſiderable trade in ſilk. Lon. 4. 2. W. Lat. 37. 45. N.

ANDUX, or } a town of France, in the de-
ANGUZE, } partment of Herault, ſeated on the river Gardon, 25 m. N. of Montpelier. It carries on a conſiderable trade in ſerges and woollen cloth. Lon. 3. 42. E. Lat. 43. 39. N.

ANDWORTSKOW, a diſtrict of Zealand.

(1.) *To* ANEAL, *v. a.* to bake or harden glaſs, tiles, &c. in the fire. *Bailey.*

(2.) *To* ANEAL, in metallurgy, to give gold, ſilver, or copper, a red heat.

ANEAU, Bartholomew, a native of Bourges in France, a man of learning in the 16th century, educated under Melchior Volmar. He was profeſſor at Lyons, where he propagated the doctrines of the Reformation ſecretly for a long time: but on the feſtival of the Holy Sacrament 1565, as the proceſſion was paſſing on towards the college, there was a large ſtone thrown from one of the windows upon the Hoſt and the prieſt who carried it. The people, enraged at this, broke into the college, and aſſaſſinated Mr Aneau, whom they imagined to have been the occaſion, and the college itſelf was ſhut up next day by order of the city.

(1.) * ANECDOTE. *n. ſ.* [ανεκδοτον.] 1. Something yet unpubliſhed; ſecret hiſtory.—

Some modern *anecdotes* aver,
He nodded in his elbow chair. *Prior.*

2. It is now uſed, after the French, for a biographical incident; a minute paſſage of private life.

(2.) ANECDOTE, more properly denotes a relation of detached and intereſting particulars. The word is Greek, ανεκδοτα, q. d. *things not yet known*, or *hitherto kept ſecret*. Procopius gives this title to a book which he publiſhed againſt Juſtinian and his wife Theodora; and he ſeems to be the only perſon among the ancients, who has repreſented princes ſuch as they are in their domeſtic relation.—Varillas publiſhed Anecdotes of the Houſe of Medicis.

(3.) ANECDOTES is alſo an appellation given to ſuch works of the ancients as have not yet been publiſhed. In which ſenſe, M. Muratori gives the name *Anecdota Græca* to ſeveral writings of the Greek fathers, found in the libraries, and firſt publiſhed by them.—F. Martene has given a *Thaſaurus Anecdotarum Novus*, in 5 vols. folio.

ANEE, in commerce, a meaſure for grain, uſed in ſome provinces of France. At Lyons, it ſignifies alſo a certain quantity of wine, which is the load an aſs can carry at once: which is fixed at 80 Engliſh quarts, wine-meaſure.

ANEGADA, one of the Carribbee Iſlands Lon. 64. 7. W. Lat. 18. 40. N.

ANELACIUS, a dagger. *Bailey.*

ANELE, indigo. *Bailey.*

ANEMIUS FURNUS, among chemiſts, a wind furnace; uſed to make fierce fires for melting, &c.

* ANEMOGRAPHY. *n. ſ.* [ανεμος and γραφω.] The deſcription of the winds.

ANEMOMACHIA, [from ανεμος, wind, and μαχη, fight,] in ſome ancient writers, denotes a whirlwind, or hurricane. In which ſenſe, we ſome-

ſometimes alſo meet with *anemozale*, *anemotaraxis*, &c.

(1.) * ANEMOMETER. *n. ſ.* [ανεμος and μετρον.] An inſtrument contrived to meaſure the ſtrength or velocity of the wind.

(2.) ANEMOMETERS of various kinds have been invented at different times, and by different perſons. The one, repreſented in Plate XIV. has been often experienced, and found to anſwer the intention.—An open frame of wood, ABCDEFG HI, is ſupported by the ſhaft or arbor I. In the two croſs-pieces H K, L M, is moved a horizontal axis Q M, by means of the four nails, *ab*, *cm*, *Qf*, *gb*, expoſed to the wind in a proper manner. Upon this axis is fixed a cone of wood, MNO; upon which, as the ſails move round, a weight R, or S, is raiſed by a ſtring round its ſuperfices, proceeding from the ſmaller to the larger end NO. Upon this larger end or baſe of the cone, is fixed a rocket wheel *k*, in whoſe teeth the click X falls, to prevent any retrogade motion from the depending weight.—The ſtructure of this machine ſufficiently ſhows that it may be accommodated to eſtimate the variable force of the wind; becauſe the force of the weight will continually increaſe as the ſtring advances on the conical ſurface, by acting at a greater diſtance from the axis of motion; conſequently, if ſuch a weight be added on the ſmaller part M, as will juſt keep the machine in equilibrio in the weakeſt wind, the weight to be raiſed as the wind becomes ſtronger, will be increaſed in proportion, and the diameter of the cone NO may be ſo large in compariſon to that of the ſmaller end at M, that the ſtrongeſt wind ſhall but juſt raiſe the weight at the greater end.—If, for example, the diameter of the axis be to that of the baſe of the cone NO as 1 to 28; then, if S be a weight of one pound at M on the axis, it will be equivalent to 28 pounds when raiſed to the greater end: if therefore, when the wind is weakeſt, it ſupports one pound of the axis, it muſt be 28 times as ſtrong to raiſe the weight to the baſe of the cone. If therefore a line of ſcale of 28 equal parts be drawn on the ſide of the cone, the ſtrength of the wind will be indicated by that number on which the ſtring reſts.

(1.) * ANEMONE. *n. ſ.* [ανεμος.] The wind flower.—Upon the top of its ſingle ſtalk, ſurrounded by a leaf, is produced one naked flower, of many petals, with many ſtamina in the centre; the ſeeds are collected into an oblong head, and ſurrounded with a copious down. The principal colours in *anemonies*, are white, red, blue, and purple ſometimes curiouſly intermixed. *Miller.*

(II.) ANEMONE, WIND-FLOWER: A genus of the polygamia order, belonging to the polyandria claſs of plants; and, in the natural method, ranking under the 26th order, Multiſiliquæ. It has its name from the Greek ανεμος, ſignifying the wind; becauſe the flower is ſuppoſed not to open unleſs the wind blows.—The characters are: There is no calyx: The corolla conſiſts of petals of two or three orders three in each ſeries, oblongiſh: The ſtamina conſiſt of numerous capillary filaments; the antheræ didymous and erect. The piſtillum has numerous germina collected into a head; the ſtyli are pointed; the ſtigmata obtuſe: There is no pericarpium; the receptaculum is globular: The ſeeds are very numerous.—Of this genus Dr Linnæus enumerates 21 ſpecies; but thoſe valuable on account of the beauty of their flowers are only the following:

1. ANEMONE APPENNINA is a native of Britain, and grows in woods. The flowers of this ſpecies are ſometimes ſingle, and ſometimes double; their colours are white, blue, or violet. They appear in April.

2. ANEMONE CORONARIA. } Theſe two are na-
3. ANEMONE HORTENSIS. } tives of the Levant, particularly of the Archipelago iſlands, where the borders of the fields are covered with them of the moſt beautiful colours. When they grow wild, the flowers are commonly ſingle; but by culture they are greatly improved: they become large and double, making ſome of the greateſt ornaments of gardens. Their principal colours are red, white, purple, and blue; ſome of them are finely variegated with red, white, purple, and many intermediate ſhades of theſe colours.

4. ANEMONE NEMOROSA grows wild in the woods in many parts of Britain, where it flowers in April and May. The flowers are white, purple, or reddiſh purple, ſometimes ſingle, and ſometimes double, ſo that they make a pretty appearance. They are propagated like the firſt.

(III.) ANEMONE, CULTIVATION, &c. OF THE. The 1ſt and 4th ſpecies may be propagated by taking up their roots when the leaves decay, and tranſplanting them into wilderneſſes, where they will thrive and increaſe greatly if they are not diſturbed. The 2d and 3d ſpecies require a good deal of care, and ample directions for their culture.—The ſoil, in which theſe flowers will thrive extremely, may be compoſed in the following manner: Take a quantity of freſh untried earth (from a common or paſture land), of a light ſandy loam or hazel mould, obſerving not to take it above ten inches deep below the ſurface; and if the turf be taken with it, the better, provided it has time to rot thoroughly before it is uſed: mix this with a third part of rotten cow-dung, and lay it in a heap, keeping it turned over at leaſt once a month for 8 or 10 months, the better to mix it and rot the dung and turf, and to let it have the advantages of the free air. All great ſtones ſhould be taken out, and the clods broken; but the earth ſhould not be ſifted. This ſhould be mixed ſome months before it is uſed, if poſſible; but if compelled to uſe it ſooner, it muſt be often turned over, obſerving to take out all the parts of the green ſward that are not quite rotten, as they would be prejudicial to the roots. The beginning of September is a proper ſeaſon to prepare the beds for planting, which (if in a wet ſoil) ſhould be raiſed with this ſort of earth 6 or 8 inches above the ſurface of the ground, laying at the bottom ſome of the rakings of the heap to drain off the moiſture; but, in a dry ſoil, 3 inches above the ſurface, will be ſufficient: this compoſt ſhould be laid at leaſt 2 feet and a half thick, and in the bottom there ſhould be about 4 or 5 inches of rotten neats dung, or the rotten dung of an old melon or cucumber bed. The beds muſt be laid (if in a wet ſoil) a little round, to ſhoot off the water; but in a dry one nearer to a level. In warm land, where the beds are raiſed above the ſurface

it will be proper to fill up the paths between them, in winter, either with rotten tan or dung, to prevent the froſt from penetrating into the ſides of the beds, which otherwiſe may deſtroy their roots. The earth ſhould be laid in the beds at leaſt a fortnight or 3 weeks before the roots are planted, (but the longer the better,) that it may ſettle; and when they are planted, ſtir the upper part of the ſoil about 6 inches deep, with a ſpade; then rake it even, and with a ſtick draw lines each way of the bed at 6 inches diſtance, ſo that the whole may be in ſquares, that the roots may be planted regularly: then with 3 fingers make a hole in the centre of each ſquare, about 3 inches deep, laying therein a root with the eye uppermoſt; and when the bed is finiſhed rake the earth ſmooth, ſo as to cover the roots about two inches thick. The beſt ſeaſon for planting theſe roots for forward flowers, is about the latter end of September, and for thoſe of a middle ſeaſon any time in October; but this ſhould be done at or near the time of ſome gentle ſhowers; for if planted when the ground is dry, and there ſhould no rain fall for 3 weeks or a month after, the roots will be apt to grow mouldy upon the crown; and if once they get this diſtemper, they ſeldom proſper. As all the fine varieties of theſe flowers were firſt obtained from ſeeds, no good floriſt ſhould neglect to ſow them; for which he ſhould provide himſelf with a quantity of good roots of the ſingle, or what the gardeners call *poppy*, anemonies, of the beſt colours, and ſuch as have ſtrong ſtems, large flowers, and many leaves; theſe ſhould be planted early, that they may produce good ſeeds, which will be ripe in 3 weeks or a month after the flowers are paſt; when the ſeeds muſt be carefully gathered, otherwiſe they will be blown away, being incloſed in a downy ſubſtance. This ſeed muſt be preſerved till the beginning of Auguſt, when it may either be ſown in pots, tubs, or a well-prepared bed of light earth; in doing which, care muſt be taken not to let the ſeeds be in heaps. The beſt method is to mix them with a little fine ſand, and, when ſown, gently ſtreak the bed with a ſtrong hair-bruſh. In about two months after ſowing, the plants will begin to appear, if the ſeaſon has proved favourable. The firſt winter after they appear above ground, they are ſubject to injuries from hard froſts, or too much wet, againſt both of which they muſt be defended; for the froſt is very apt to looſen the earth, ſo that the young plants are often turned out of the ground; after which a ſmall froſt will deſtroy them; and too much wet often rots their tender roots, ſo that all the former trouble may be loſt for want of care in this particular: nor is any thing more deſtructive than the cold black froſts and winds of February and March, from which they muſt be carefully defended, by placing a low reed fence on the N. and E. ſides of the bed, which may be faſtened to a few ſtakes to ſupport it, and may be taken quite away as the ſeaſon advances, or removed to the S. and W. ſides of the bed, to ſcreen it from the violence of the ſun, which often impairs theſe plants when young. As the ſpring advances, if the weather ſhould prove dry, they muſt be gently refreſhed with water, which will greatly ſtrengthen the roots; and when the green leaves are decayed, if the roots are not too thick to remain in the ſame bed another year, all the weeds and decayed leaves muſt be ſwept off the bed, and a little more of the ſame prepared earth, ſifted about a quarter of an inch thick over the ſurface. At Michaelmas this ſhould be repeated, but as the roots left in the ground will come up early in autumn, the beds ſhould be carefully covered in froſty weather, otherwiſe their leaves will be injured, whereby the roots will be weakened, if not deſtroyed. If the roots ſucceed well, many of them will flower the ſecond year, when the beſt may be ſelected and marked; but none ſhould be deſtroyed, till after the 3d year, when they blow ſtrong, and their goodneſs can be determined. The ſingle anemonies flower moſt part of the winter and ſpring, when the ſeaſons are favourable, if planted in a warm ſituation, at which time they make a fine appearance, and therefore deſerve a place in every flower garden. There are ſome fine blue colours amongſt theſe ſingle anemonies, which, with the ſcarlets and reds, make a beautiful mixture; and as theſe begin flowering in January or February, when the weather is cold, they will continue a long time in beauty, provided the froſt is not too ſevere, or if they are covered with mats. The ſeeds of theſe are ripe by the middle or end of May; and muſt be gathered daily as they ripen. Horned cattle, when removed from the higher grounds into woods and woody paſtures, frequently eat the wood anemone; and, according to Linnæus and Gunner, many obſervations have proved that it cauſes the bloody flux among them.

(IV.) ANEMONE, SEA. See ANIMAL FLOWER.

(1.)* ANEMOSCOPE. *n. ſ.* [ἄνεμος and σκοπέω.] A machine invented to foretel the changes of the wind. It has been obſerved, that hydroſcopes made of cat's gut proved very good *anemoſcopes*, ſeldom failing, by the turning the index about, to foretel the ſhifting of the wind. *Chambers.*

(2.) ANEMOSCOPE, DESCRIPTION OF THE. This machine conſiſts of an index moving about an upright circular plate, like the dial of a clock, on which the 32 points of the compaſs are drawn inſtead of the hours. The index, which points to the diviſions on the dial, is turned by a horizontal axis, having a trundle-head at its external extremity. This trundle-head is moved by a cog-wheel on a perpendicular axis; on the top of which a vane is fixed, that moves with the courſe of the wind, and puts the whole machine in motion. The whole contrivance is extremely ſimple; and nothing required in the conſtruction, but that the number of cogs in the wheel, and rounds in the trundle-head, be equal; becauſe it is neceſſary, that when the vane moves entirely round, the index of the dial alſo make a complete revolution. An anemoſcope of this kind is placed in one of the turrets of the queen's palace. There is alſo one on the W. end of the regiſter office at Edinburgh. The anemoſcope calculated for indicating the force or velocity of the wind, is the ſame with what moſt writers call an *anemometer*; and we have accordingly deſcribed one of thoſe machines under that article. We ſhall here add another, contrived by the late Mr Pickering, and publiſhed in the *Philoſophical Tranſactions*, N°

473. This anemoſcope is a machine four feet and a quarter high, conſiſting of a broad and weighty pedeſtal, a pillar faſtened into it, and an iron axis of about half an inch diameter faſtened into the pillar. Upon this axis turns a wooden tube; at the top of which is placed a vane, of the ſame materials, 21 inches long, conſiſting of a quadrant, graduated, and ſhod with an iron rim, notched to each degree; and a counterpoiſe of wood, as in the figure, on the other. Through the centre of the quadrant runs an iron pin, upon which are faſtened two ſmall round pieces of wood, which ſerve as moveable radii to deſcribe the degrees upon the quadrant, and as handles to a velum or ſail, whoſe plane is one foot ſquare, made of canvas, ſtretched upon 4 battens, and painted. On the upper batten, next to the ſhod rim of the quadrant, is a ſmall ſpring which catches at every notch correſponding to each degree, as the wind ſhall, by preſſing againſt the ſail, raiſe it up; and prevents the falling back of the ſail, upon leſſening of the force of the wind. At the bottom of the wooden tube, is an iron index, which moves round a circular piece of wood faſtened to the top of the pillar on the pedeſtal, on which are deſcribed the 32 points of the compaſs. The figure of this machine is given on Plate XIV. where *a* is the pedeſtal; *b*, the pillar on which the iron axis is fitted; *c*, the circle of wood, on which are deſcribed the 32 points of the compaſs; *e*, the wooden tube upon its axis; *f*, the velum; *g*, the graduated quadrant; *h*, the counterpoiſe of the vane. The adjoining figure repreſents the velum, which takes off; *a* is the plane of the velum; *b* the ſpring; *c*, the wooden radii; *d*, *d*, the holes through which the pin in the centre of the quadrant goes.

(3.) ANEMOSCOPE, USES OF THE. Having a circular motion round the iron axis, and being furniſhed with a vane at top, and index at the bottom, when once the artificial cardinal points, deſcribed on the round piece of wood on the pillar, are fixed to the ſame quarters of the heavens, it gives a faithful account of that quarter from which the wind blows. 2. By having a velum or ſail, elevated by the wind, along the arch of the quadrant, to an height, proportionable to the power of the column of wind preſſing againſt it, the relative force of the wind, and its comparative power, at any two times of examination, may be accurately taken. 5. By having a ſpring fitted to the notches of the iron with which the quadrant is ſhod, the velum is prevented from returning back upon the fall of the wind; and the machine gives the force of the higheſt blaſt, ſince the laſt time of examination, without the trouble of watching it. The ingenious inventor of this machine tells us, that he careſully examined what dependence may be had upon it, during the ſtorms of February 1743-4, and found that it anſwered exceeding well; for that, in ſuch winds as the ſailors call violent ſtorms, the machine had ſix degrees to ſpare, for a more violent guſt, before it comes to a horizontal poſition. It is certainly to be depended upon in ordinary weather, the velum being hung ſo tenderly, as to feel the moſt gentle breeze. There is, however, reaſon to fear, that the expoſing the anemoſcope to all winds, for a continuance, muſt diſorder it, eſpecially irregular blaſts and ſqualls. It may not, therefore, be amiſs, in violent weather, for the obſerver to take the tube with its vane and velum in his hand, in order to know the force of the wind; and, when he has finiſhed his obſervations, to carry the machine into the houſe, till the violence of the ſtorm is abated, when it may be replaced in its former ſituation.

ANEMOSPERMOS. See ARCTOTIS.

ANEMOZALE. See ANEMOMACHIA.

* ANENT. *prep.* A word uſed in the Scotch dialect. 1. Concerning; about; as, *he ſaid nothing* anent *this particular*. 2. Over againſt; oppoſite; as, *he lives* anent *the market houſe*.

ANER, ESHCOL, and MAMRE, were three Canaanitiſh princes, who aſſiſted Abraham in his purſuit and defeat of Chedorlaomer, and his allies. Not imitating the generoſity of that patriarch, they took their ſhare of the booty which had been taken from the Sodomites, and recovered. Gen. xiv. 13—24.

ANER, a city of the half tribe of Manaſſeh, to the weſt of Jordan. It was either the ſame with Taanach, or exchanged for it, 1 Chron. vi. 70. Joſh. xxi. 25.

* ANES, AWNS. *n. ſ.* The ſpires or beards of corn. *Dict.*

ANET, a large and handſome palace in the iſle of France, near the Eure, built by Henry II. It is 40 miles from Paris.

ANET, the herb, dill. See next article.

(1.) ANETHUM, DILL and FENNEL: A genus of the digynia order, belonging to the pentandria claſs of plants; and, in the natural method, ranking under the 45th order, umbellatæ. The eſſential characters are: The fruit is oval, compreſſed, ſtriated; and the petals, 5, are involute, entire, and very ſhort.

1. ANETHUM FENICULUM, or fennel; of which there are two varieties, the common and the ſweet. The ſweet fennel is ſmaller in all its parts than the common, except the ſeeds, which are conſiderably larger. The ſeeds of the two ſorts differ likewiſe in ſhape and colour; thoſe of the common are roundiſh, oblong, flattiſh on one ſide and protuberant on the other, of a dark, almoſt blackiſh colour; thoſe of the ſweet are longer narrower, not ſo flat, generally crooked, and of a whitiſh or pale yellowiſh colour. Both ſorts are cultivated in our gardens: the common is a perennial plant: the ſweet fennel periſhes, after it has given ſeed; nor do its ſeeds come to ſuch perfection in this climate, as thoſe which we receive from Germany.

2. ANETHUM GRAVEOLENS, or dill, is an annual plant: the root is long, ſlender, and white; the leaves are divided into a multitude of fine long, narrow ſegments like thoſe of fennel, but of a bluiſh green colour, and leſs ſtrong ſmell. The ſtalk is round and firm, growing to the height of four feet, with yellow flowers, in moderately large umbels.

(II.) ANETHUM, MEDICINAL USES OF THE. Of the firſt ſpecies, the fennel, both the ſeed and roots are uſed in medicine. The ſeeds of both the fennels have an aromatic ſmell, and a moderately warm pungent taſte: thoſe of the

ſweet

ſweet fennel are in flavour moſt agreeable, and have alſo a conſiderable degree of ſweetneſs; hence our colleges have directed the uſe of theſe only. They are ranked among the four greater hot ſeeds, and not undeſervedly looked upon as good ſtomachics and carminatives. A ſimple water is prepared from them in the ſhops; they are ingredients alſo in the compound ſpirit of juniper, and ſome other officinal compoſitions. The root is far leſs warm, but has more of a ſweetiſh taſte, than the ſeeds: it is one of the five roots called *openers*; and has ſometimes been directed in aperient apozems. Boerhaave ſays, that this root agrees in taſte, ſmell, and medical qualities, with the celebrated *ginſeng* of the Chineſe; from which, however, it appears to be very conſiderably different. The leaves of fennel are weaker than either the roots or ſeeds, and have very rarely been employed for any medicinal uſe. 2. Of the laſt ſpecies, dill, only the ſeeds are uſed.—They are of a pale yellowiſh colour, in ſhape nearly oval, convex on one ſide, and flat on the other. Their taſte is moderately warm and pungent; their ſmell aromatic, but not of the moſt agreeable kind. Several preparations of them are kept in the ſhops. They are recommended as a carminative, in flatulent colics, proceeding from a cold cauſe, or a vicinity of the juices.

ANEURIN, called the ſovereign of Bards and of flowing muſic, a celebrated Britiſh poet, who flouriſhed about the beginning of the 6th century. He was a chieftain among the Olodinian Britons, who behaved valiantly at the battle of Cattraeth, which he celebrates in an excellent poem preſerved in the Welſh archaiology. This, with another piece, entitled the Odes of the Months, are all that now remain of his works. He died about A. D. 570.

(1.) * ANEURISM. *n. ſ.* [ανευρυνω.] A diſeaſe of the arteries, in which, either by a preternatural weakneſs of any part of them, they become exclufively dilated, or by a wound through their coats, the blood is extravaſated amongſt the adjacent cavities. *Sharp.*—In the orifice, there was a throbbing of the arterial blood, as in an *aneurism*. *Wiſeman.*

(2.) ANEURISM may be ſtill more accurately deſcribed, a throbbing tumour, diſtended with blood, and formed by a dilatation or rupture of an artery. See SURGERY INDEX.

* ANEW. *adv.* [from *a* and *new*.] 1. Over again; another time; repeatedly. This is the moſt common uſe.—The miſeries of the civil war ſo, for many years, deter the inhabitants of our land from the thoughts of engaging *anew* in ſuch deſperate undertakings. *Addiſon.* 2. Newly; in a new manner.—He who begins late, is obliged to form *anew* the whole diſpoſition of his ſoul, to acquire new habits of life, to practiſe duties to which he is utterly a ſtranger. *Rogers.*

ANEWST, almoſt; nigh; about. *Chauc.*

ANEY, or ANGIE, uneaſineſs; vexation. *Chauc.*

ANFA, a diſtrict of Temecen, in Africa.

ANFELDTHYDE, or ANFEALTHILE, in the old Saxon law, a ſimple accuſation; for the Saxons had two ſorts of accuſation, viz. *ſimplex* and *triplex*. That was called ſingle, when the oath of the criminal, and of two more were ſufficient to diſcharge him: but his own oath, and the oaths of five more, were required to free him *a triplice accuſatione*.

ANFILOCHA, a town of ancient Epirus, now called Jeroirlia. It was almoſt ruined, during the wars between the Venetians and Turks.

* ANFRACTUOSE. } *adj.* [from *anfractus*,
* ANFRACTUOUS. } Lat.] Winding; mazy; full of turnings and winding paſſages.—Behind the drum are ſeveral vaults and *anfractuoſe* cavities in the ear bone, ſo to intend the leaſt ſound imaginable, that the ſenſe might be affected with it; as we ſee in ſubterraneous caves and vaults, how the ſound is redoubled. *Ray.*

* ANFRACTUOUSNESS. *n. ſ.* [from *anfractuous*.] Fulneſs of windings and turnings.

* ANFRACTURE. *n. ſ.* [from *anfractus*, Lat.] A turning; a mazy winding and turning. *Dict.*

ANGARA, a river of Aſiatic Ruſſia.

ANGARI, or ANGARII, in antiquity, public couriers, appointed for the carrying of meſſages. The ancient Perſians, Budæus obſerves, had their αγγαρειον δρομημα; a ſet of couriers on horſe back, poſted at certain ſtages, always in readineſs to receive the diſpatches from one, and forward them to another, with celerity, anſwering to what the moderns call *poſts*, q. d. *poſiti*, as being poſted at certain places or ſtages.—The angari were alſo called by the Perſians *aſtandæ*; by the Greeks ημεροδρομοι, on account of the long journeys they made in one day, which according to Suidas amounted to no leſs than 1500 ſtadia.

(1.) ANGARIA, in Roman antiquity, a kind of public ſervice impoſed on the provincials, which conſiſted in providing horſes and carriages for the conveyance of military ſtores, and other public burdens. It is ſometimes alſo uſed for a guard of ſoldiers, poſted for the defence of a place. In a more general ſenſe, it is uſed for any kind of ſervices performed through compulſion.

(2.) ANGARIA, in the civil law, a duty required of ſubjects, to furniſh horſes and carts, for the conveyance of corn, &c. for the king's troops. Alſo any ſervice which one is obliged to perform for another.

ANGAZYA, one of the Comora iſlands, lying, between the north end of Madagaſcar and the coaſt of Zanguebar in Africa, from Lat. 10° to 15° S. It is inhabited by Moors, who trade with divers parts of the continent, in cattle, fruits, and other commodities of the iſland; which they exchange for callicoes and other cotton cloths. The houſes here are built of ſtone, and lime made of calcined oyſter-ſhells; with which the walls and roof are plaſtered in a very elegant manner. The government of Angazya is a pure ariſtocracy; the iſland being ſubject to 10 lords, who have all the title of *Sultan*. The people are very careful of their women; never permitting ſtrangers to ſee them without permiſſion from a ſultan or an order which the ſtranger brings with him. Many of them read and write Arabic with great facility; and ſome underſtand Portugueſe, which they learn from their intercourſe with Moſambique, whither they trade in veſſels of 40 tons burthen.

ANGE DE ST JOSEPH, Le Pire, a cardinal of Thouloufe. He was ſometime miſſionary in Perſia, and tranſlated the Perſian Pharmacopœia into Latin, which was printed at Paris in 1681. He alſo

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publiſhed the Gazophylacium Linguæ Perſarum; Amſt. 1684. He died in 1697.

ANGE DE ST ROSALIE, an Auguſtine monk, was born at Blois in 1655, and died in 1726. He wrote the Hiſtory of the Houſe of France, and of the great Offices of the Crown, which was publiſhed after his death, in 9 vols. fol. He was likewiſe the author of the State of France, in 5 vols. 12mo.

ANGEIOGRAPHY, [from ἀγγεῖον, a veſſel, and γράφω, to deſcribe,] the deſcription of all kinds of ancient inſtruments, veſſels, and utenſils, both domeſtic, military, and nautical. Angeiography alſo includes the conſideration of weights, meaſures, &c.

ANGEIOLOGY, in anatomy, the deſcription of the veſſels in a human body; *e. g.* the nerves, veins, and lymphatics. See ANATOMY, INDEX.

ANGEIOTOMY, in ſurgery, implies the opening a vein or artery, as in bleeding; and conſequently includes both arteriotomy and phlebotomy.

(1.) * ANGEL. *adj.* Reſembling angels; angelical.—

I have mark'd
A thouſand bluſhing apparitions
Start into her face; a thouſand innocent ſhames
In *angel* whiteneſs bear away thoſe bluſhes.
Shakeſpeare.

(2.) * ANGEL. *n. ſ.* [Ἄγγελος; *angelus*, Lat.] 1. Originally a meſſenger. A ſpirit employed by God in the adminiſtration of human affairs.—Had we ſuch a knowledge of the conſtitution of man, as it is poſſible *angels* have, and it is certain his Maker has; we ſhould have a quite other idea of his eſſence. *Locke.* 2. *Angel* is ſometimes uſed in a bad ſenſe; as, *angels of darkneſs.*—And they had a king over them, which was the *angel* of the bottomleſs pit. *Rev.* 3. *Angel*, in ſcripture, ſometimes means *man of God, prophet.* 4. *Angel* is uſed, in the ſtyle of love, for a beautiful perſon.—

Thou haſt the ſweeteſt face I ever look'd on.
Sir, as I have a ſoul, ſhe is an *angel.* *Shakeſp.*

5. A piece of money anciently coined and impreſſed with an angel, in memory of an obſervation of Pope Gregory, that the Pagan *Angli*, or Engliſh, were ſo beautiful, that, if they were Chriſtians, they would be *Angeli*, or *angels.* The coin was rated at ten ſhillings.—Take an empty baſon, put an *angel* of gold, or what you will, into it; then go ſo far from the baſon, till you cannot ſee the *angel*, becauſe it is not in a right line; then fill the baſon with water, and you will ſee it out of its place, becauſe of the reflection. *Bacon.*

(3.) ANGEL, ETYMOLOGY AND DEFINITION OF. [Engel, Teut. from Ἄγγελος, Gr. a meſſenger,] a ſpiritual intelligent ſubſtance, the firſt in rank and dignity among created beings. The Hebrew word מלאך ſignifies the ſame with the Greek. The angels are in Daniel, (iv. 13, &c.) called עירין, or *Watchers*, from their vigilance: for the ſame reaſon they are, in the remains we have of the prophecy attributed to Enoch, named *Egregori*; which imports the ſame in Greek. Angels therefore, in the proper ſignification of the word, do not import the nature of any being, but only the office, to which they are appointed, eſpecially by way of meſſage, or intercourſe between God and his creatures; in which ſenſe they are called the *miniſters of God*, who do his pleaſure, and *miniſtering ſpirits* ſent forth to miniſter for them who ſhall be heirs of ſalvation.

(4.) ANGELS, ANCIENT AND GENERAL BELIEF OF. That there are ſuch beings as we call *angels*, that is, certain permanent exiſtences, inviſible and imperceptible to our ſenſes endued with underſtanding and power ſuperior to that of human nature, created by God, and ſubject to him as the ſupreme Being; miniſtering to his divine providence in the government of the world by his appointment, and more eſpecially attending the affairs of mankind; is a truth ſo fully atteſted by ſcripture, that it cannot be doubted. Nay, the exiſtence of ſuch inviſible beings was generally acknowledged by the ancient heathens, though under different appellations: the Greeks called them *dæmons*; and the Romans *genii* or *lares.* Epicurus ſeems to have been the only one among the old philoſophers, who, like Zadock and his followers, the Sadducees, among the Jews, abſolutely denied their exiſtence. Indeed, the belief of middle intelligences influencing the affairs of the world, and ſerving as miniſters or interpreters between God and man, is as extenſive as the belief of a God; having never, ſo far as we know, been called in queſtion by thoſe who had any religion at all.

(5.) ANGELS, CREATION OF. The creation of angels is not expreſsly mentioned by Moſes in the firſt of Geneſis, yet it is generally conſidered by judicious expoſitors as implied. The reaſon why the ſacred hiſtorian is ſilent on this ſubject, is ſuppoſed by Berrington to be the natural pronenes of the gentile world, and even of the Jews, to idolatry. And it is thought, if they worſhipped mere material elements, which was the caſe, much more might they be inclined to worſhip ſuch ſuperior and ſublime beings as angels. But a better reaſon is perhaps given by other writers, viz. that this firſt hiſtory was purpoſely and principally written for information concerning the viſible world; the inviſible, of which we know but a part, being reſerved for a better life.

(6.) ANGELS, DISPUTE RESPECTING THE TIME OF THEIR CREATION. Much idle controverſy, and many fruitleſs conjectures, have taken place among the learned, reſpecting the time when the angels were created. The majority of theological writers ſeem to have taken it for granted, that their creation, though not mentioned by Moſes, conſtituted a part of the Almighty's firſt days work. Biſhop Hopkins inſiſts, that it muſt have been within the ſix days creation, becauſe within that ſpace, "God made heaven and earth and *all* things that are therein." Lightfoot, Caryl, and others, lay great ſtreſs upon the words Gen. ii. 1. "Thus the heavens and the earth were finiſhed, and *all the hoſt* of them." And Dr Charnock reckons the incipient words of the firſt chapter, "In the *beginning*" deciſive; "becauſe, ſays he, "before the beginning of the creation and the beginning of time, there could be nothing but eternity; nothing but what was uncreated that is, nothing but what was without beginning. This argument is evidently a play upon words

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but the learned Dr Gill argues ſtill more ridiculouſly, by aſking, "if angels were created *before* the heavens, (by which he muſt certainly mean the material viſible heavens,) *where* could they exiſt?"—As if infinite ſpace could not afford room for immaterial beings!—Throughout the whole of this controverſy, theſe learned divines ſeem to have overlooked the chief, if not the ſole intention of revelation, which, they muſt all admit, is the ſalvation of mankind. The creation of man, and the globe he inhabits; his original ſtate, his fall, the promiſe of a Saviour, the hiſtory of the peculiar people, among whom the Saviour was to appear, their typical diſpenſations, and the ſeries of events connected therewith, &c. were neceſſary for that purpoſe, and therefore are particularly recorded and revealed. But the creation of angels, as well as of *devils*; the revolutions and magnitude of the planets; the nature of their inhabitants; and even the form of our own globe, with the particular hiſtory of its antediluvian and poſt-diluvian inhabitants, for the firſt 3000 years nearly, with many other things which curioſity might wiſh to pry into, not being neceſſary to man's ſalvation, are not revealed. Even the ſin of Satan and his aſſociates, by which they fell from being angels of light, is but obſcurely hinted at in ſcripture, the knowledge of it not being neceſſary for that great object. From this general view of the intention of revelation, we cannot be ſurpriſed at the ſilence of Moſes upon the creation of angels, or that of the other inſpired writers, upon a variety of other ſubjects. But we have no reaſon to infer, from that ſilence, that the angels did not exiſt long before the creation of our world. On the contrary, we have every reaſon to conclude, that not only angels and other immaterial beings, were created many ages before the creation of our globe, but that even myriads of ſtars had been created, and planets revolved in the immenſity of ſpace, many ages before the creation of our ſun, and the planets that circulate around him. Mr Nichols, in his *Conference with a Theiſt*, one of the moſt judicious works that have been wrote in modern times, to reconcile revelation with the facts of modern philoſophy, reſtricts the ſix days creation entirely to our ſublunary ſyſtem; and argues, that the clauſe, "he made the ſtars alſo" at the end of the 16th verſe of the 1ſt chap of Geneſis, is evidently an interpolation; thrown in probably by ſome Jewiſh tranſcriber, who had wiſhed to ſupply what he thought an omiſſion of Moſes. Be that as it may, the Moſaic account of the creation and the whole books of revelation, being wrote for the inſtruction of mankind in the way of ſalvation, and not in philoſophy, it was quite unneceſſary to mention theſe creations of other beings, and of other worlds, which had taken place long before; but only to ſtate the ſimple narrative of the creation of man, and of all thoſe things that were neceſſarily connected with his preſent ſtate of exiſtence. As for the word *All*, upon which ſo much ſtreſs is laid by divines, it can with as little reaſon be extended to all the works of the Almighty, throughout the infinity of ſpace, as a ſimilar expreſſion in Matth. iii. 5. can be ſuppoſed to mean the *whole* inhabitants of Jeruſalem. The paſſage, if interpreted literally, would involve a contradiction to what we know to be the fact. "Then went out to him *Jeruſalem and* ALL *Judea, and* ALL *the region* round about Jordan, and were baptized of him." As no judicious commentator will explain the word *all*, in this paſſage, to mean more than a great number of the people, ſo no Chriſtian philoſopher, who is acquainted with aſtronomy, will explain the words *all the hoſt of them*, to imply more than the ſun and the planets in our ſublunary ſyſtem; which, conſidering their magnitudes, diſtances, and numbers, primary and ſecondary, (which, from the very late diſcovery of the *Georgium ſidus*, are probably much greater than we have yet diſcovered,) ſufficiently merit the title of a *hoſt*. Conſidering matters in this view, the argument drawn from the words *in the beginning*, will appear quite inconcluſive; for certainly the day of the creation of our globe is the beginning of time to its inhabitants, and, as ſuch, the only proper æra for our ſacred hiſtorian to date his hiſtory from, if myriads of angels, and millions of other worlds, ſhould have been created and exiſted for many ages before it. Indeed to ſuppoſe, with the majority of divines, that no creatures whatever, neither material nor ſpiritual neither angels nor other worlds, had been created, previous to the creation of our world, is to ſuppoſe, that a Being of infinite power, wiſdom, and goodneſs, had remained totally inactive from all eternity, and had permitted the infinity of ſpace to continue a perfect vacuum, till within theſe 6000 years! Such narrow minded ideas of the Almighty and his works, and ſuch forced conſtructions put upon particular texts by divines, tend to diſcredit the doctrines of revelation inſtead of ſerving it; and to render it contemptible in the eyes of thoſe, who have not leiſure or inclination to ſtudy its intrinſic merits. But thoſe who do, upon a ſtrict inveſtigation, will not only diſcover its peculiar internal beauties, but alſo that the whole ſyſtem, when freed from the falſe gloſs of fallible men, contains nothing inconſiſtent with ſound philoſophy.

(7.) ANGELS, NATURE AND OFFICES OF. As to the nature of theſe beings, we are told, that they are ſpirits; but whether pure ſpirits diveſted of all matter, or united to ſome thin bodies, or corporeal vehicles, has been a controverſy of long ſtanding. Not only the ancient philoſophers, but ſome of the Chriſtian fathers were of opinion, that angels were cloathed with ethereal, or fiery bodies of the ſame nature with thoſe which we ſhall one day have when we come to be equal to them. But the more general opinion, eſpecially of later times has been, that they are ſubſtances entirely ſpiritual, though they can at any time aſſume bodies, and appear in human or other ſhapes. That the angelical powers and abilities vaſtly excel thoſe of man, cannot be denied, if we conſider, that their faculties are not clogged or impeded, as ours are, by any of thoſe imperfections which are inſeparable from corporeal beings: ſo that their underſtandings are always in perfect vigour; their inclinations regular; their motions ſtrong and quick; the actions irreſiſtible by material bodies, whoſe natural qualities they can controul, or manage to their purpoſes, and occaſion either bleſſings

or

or calamities, public or private, here below; inſtances of which are too numerous to mention. Beſides their attendance on God, and their executing his commands, they are alſo preſumed to be employed in taking care of mankind and their concerns: and that every man had ſuch a tutelar or guardian angel, even from his birth, was a firm belief and tradition among the Jews; and our ſaviour himſelf ſeems to have been of the ſame ſentiment. As the numbers of theſe celeſtial ſpirits are very great, it is likewiſe reaſonable to believe that there are ſeveral orders and degrees among them; which is alſo confirmed by Scripture; whence ſome ſpeculative men have diſtributed them into 9 orders, according to the different names by which they are there called; and reduced thoſe orders into three *hierarchies*, as they call them; to the firſt of which belong ſeraphim, cherubim, and thrones; and to the ſecond, dominions, virtues, and powers; and to the third, principalities, arch-angels, and angels. They imagine farther, that there are ſome who conſtantly reſide in heaven; others who are miniſters, and ſent forth, as there is occaſion, to execute the orders they receive from God by the former. The Jews reckon but four orders or companies of angels, each headed by an arch-angel: the firſt order being that of Michael, and the ſecond of Gabriel, the third of Uriel, and the fourth of Raphael: but though the Jews believe them to be four, yet it ſeems there were rather ſeven. The Perſians alſo held, there were ſubordinate degrees among the angels.

(8.) ANGELS, OPINIONS OF THE HEATHENS CONCERNING. The heathens generally believe in the doctrine of every man having a tutelary angel. They thought it a crime to neglect the admonitions of ſo divine a guide. Socrates publicly confeſſed himſelf to be under the direction of ſuch an angel, or dæmon, as ſeveral others have ſince done. And on this tutelar genius of each perſon they believed his happineſs and fortune depended. Every genius did his beſt for the intereſt of his client; and if a man came by the worſt, it was a ſign the ſtrength of his genius was inferior to that of his opponent, that is, of an inferior order; and this was governed by chance. There were ſome genii, whoſe aſcendent was ſo great over others, that their very preſence entirely diſconcerted them; which was ſuppoſed to be the caſe of that of Auguſtus in reſpect of that of Marc Antony. The Romans thought the tutelar genii of thoſe who attained the empire, to be of an eminent order; on which account they had great honours ſhown them. The nations and cities alſo had their ſeveral genii. The ancient Perſians ſo firmly believed the miniſtry of angels, and their ſuperintendance over human affairs, that they gave their names to the months, and the days of their months, and aſſigned them diſtinct offices and provinces; and it is from them the Jews confeſs to have received the names of the months and angels, which they brought with them when they returned from the Babyloniſh captivity. After which we find, they alſo aſſigned charges to the angels, and in particular the patronage of empires and nations; Michael being the prince of the Jews, as Raphael is ſuppoſed to have been of the Perſians.

(9.) ANGELS, OPINIONS OF THE MAHOMETANS, CONCERNING. The Mahometans have ſo great a reſpect for the angels, that they account a man an infidel who either denies their exiſtence, or loves them not. They believe them to be free from ſin, enjoying the preſence of God, to whom they are never diſobedient: that they have ſubtile pure bodies, being created of light; and have no diſtinction of ſexes, nor need the refreſhment of food or ſleep. They ſuppoſe them to have different forms and offices: that ſome adore God in ſeveral poſtures; others ſing his praiſes, and intercede for men; ſome carry and encompaſs his throne; others write the actions of men, and are guardians to them.

(10.) ANGELS, OPINIONS RESPECTING THE FALLEN. Although the angels were originally created perfect, good and obedient to their Maſter's will, yet ſome of them ſinned, and kept not their firſt eſtate, but left their habitation; and ſo, of the moſt bleſſed and glorious, became the moſt vile and miſerable of all God's creatures. They were expelled the regions of light, and caſt down to hell, to be reſerved in everlaſting chains under darkneſs until the day of judgement. With heaven they loſt their heavenly diſpoſition which delighted once in doing good and praiſing God; and fell into a ſettled rancour againſt him and malice againſt men: their inward peace was gone; all deſire of doing good departed from them; and, inſtead thereof, revengeful thoughts and deſpair took poſſeſſion of them, and created an eternal hell within them. And, for that offence, theſe apoſtate ſpirits fell from heaven, and plunged themſelves into ſuch an abyſs of wickedneſs and woe, are queſtions impoſſible to be determined by any clear evidence of ſcripture. As to the time, we are certain that it could not be before the ſixth day of the creation; becauſe on that day it is ſaid, "God ſaw every thing that he had made, and behold it was very good:" but that it was not long after is very probable, as it muſt have preceded the fall of our firſt parents. Some have imagined it to have been after, and that carnality, or luſting to converſe with women upon earth, was the ſin which ruined them: but this is too ridiculous to bear refutation. Others have ſuppoſed, that the angels, being informed of God's intention to create man after his own image, and to dignify his nature by Chriſt's aſſuming of it, and thinking their glory to be eclipſed thereby, envied man's happineſs, and ſo revolted; and with this opinion that of the Mahometans has ſome affinity; who are taught, that the devil, who was once one of thoſe angels who are neareſt to God's preſence, and named *Azazil*, forfeited paradiſe for refuſing to pay homage to Adam at the command of God. But on what occaſion ſoever it firſt ſhowed itſelf, pride ſeems to have been the leading ſin of the angels; who admiring and valuing themſelves too much on the excellence of their nature and the height of their ſtation, came at length to entertain ſo little reſpect for their Creator, as to be guilty of downright rebellion and apoſtaſy. It is certain from Scripture, that

theſe

these fallen angels were in great numbers, and that there were also some order and subordination preserved among them; one especially being considered as their prince, and called by several names, *Beelzebub*, *Satan*, or *Sammael* by the Jews: *Ahûriman*, by the Persians; and *Eblis*, by the Mahometans. Their constant employment is not only doing evil themselves, but endeavouring by all arts to seduce and pervert mankind, by tempting them to all kind of sin, and thereby bringing them into the same desperate state with themselves.

ANGELS, used metaphorically, are titles applied to bishops of several churches. In this sense St Paul is to be understood, where he says, "*Women ought to be covered in the church, because of the angels.*" Dr Prideaux observes, that the minister of the synagogue, who officiated in offering up the public prayers, being the mouth of the congregation, delegated by them as their representative, messenger, or angel, to speak to God in prayer for them, was therefore, in the Hebrew language, called the *angel* of the church; and thence the bishops of the seven churches of Asia are called the *angels* of those churches.

ANGEL, in commerce, a gold coin formerly current in England, so named from having the representation of an angel upon it. It weighed 4 penny-weights, and was 23½ carats fine. It had different values in different reigns; but is now only an imaginary sum, or money of account, implying ten shillings.

ANGEL, in geography, a river of N. Wales, in the county of Montgomery.

ANGEL, a territory of Denmark, in the duchy of Slefwick. See ANGLES.

ANGEL BED, an open bed, without bed posts! *Ainsw.*

ANGEL FISH, in ichthyology, a species of squalus. See SQUALUS.

* ANGEL-LIKE. *adj.* [from *angel* and *like*.] Resembling an angel.—

In heav'n itself thou sure wer't dreft
With that *angel-like* disguise. *Waller.*

* ANGEL-SHOT. *n. s.* [perhaps properly *angle-shot*, being folded together with a hinge.] Chain shot, being a cannon bullet cut in two, and the halves being joined together by a chain. *Dict.*

ANGELI, Peter, a Latin poet of the 15th century, was a native of Barga in Tuscany. He became professor of ethics and politics in the university of Pisa, where he died, in 1596. He wrote several Latin poems; the most admired of which are 1. *Cynegeticon*, or of the Chace, 1568: 2. *Syrias*, or the Expedition of Godfrey of Bouillon, for the recovery of the Holy Land, 1591. He died in 1596, aged 79.

ANGELIC. See ANGELICAL and ANGELICK.

ANGELIC GARMENT, *Angelica vestis*, among our ancestors, was a monkish garment, which laymen put on a little before their death, that they might have the benefit of the prayers of the monks. It was from them called *angelical*, because they were called *angels* who by these prayers *animæ sanctorum arrebant*. Hence, where we read the phrase *monachus ad succurrendum* in our old books, it must be understood of one who had put on the habit when he was at the point of death.

(I.) * ANGELICA. *n. f.* [Lat. *ab angelica virtute*.] The name of a plant.—It has winged leaves divided into large segments; its stalks are hollow and jointed; the flowers grow in an umbel upon the tops of the stalks, and consist of five leaves, succeeded by two large channelled seeds.—The species are, 1. Common or manured *angelica*. 2. Greater wild *angelica*. 3. Shining Canada *angelica*. 4. Mountain perennial *angelica*, with columbine leaves. *Miller.*

(II.) * ANGELICA, BERRY-BEARING. [*Aralia*, Lat.] The flower consists of many leaves, expanding in form of a rose, which are naked, growing on the top of the ovary: these flowers are succeeded by globular fruits, which are soft and succulent, and full of oblong seeds. *Miller.*

(III.) ANGELICA: A genus of the digynia order, belonging to the pentandria class of plants; and in the natural method ranking under the 45th order, Umbellatæ. The essential characters are: The fruit is roundish, angled, solid, with reflected styli; the corollæ are equal, and the petals incurvated.

1. ANGELICA ARCH-ANGELICA is a native of Hungary and Germany. The leaves are much larger than those of the common angelica, and the flowers are yellow.

2. ANGELICA ATRO-PURPUREA. } These two
3. ANGELICA LUCIDA. } species are

natives of North America, and have both the additional epithet of *Canadensis*, from their abounding in Canada, but have no great beauty, nor any particular virtue yet known.

(4.) ANGELICA SATIVA, or common angelica, which is cultivated in gardens for medicinal use, and likewise for a sweetmeat, grows naturally in the northern countries. The root of this species is brown, oblong, and an inch or two thick, fragrant, and acrid. The leaves are very large, compoſed of pinnated foliola, of an oblong oval figure, dentated at the edge, and an odd leaf at the end of the pinna lobated; the stalk is round, striated, and as thick as a child's arm. The umbels are very large, and of a globose figure; the flowers very small, and greenish.—This species grows in a moist soil: the seeds should be sown soon after they are ripe. When the plants come up about six inches high, they should be transplanted very wide, as their leaves spread greatly. If they are planted on the sides of ditches or pools of water, about three feet distance, they will thrive exceedingly.

5. ANGELICA SYLVESTRIS grows naturally in moist meadows, and by the sides of rivers, in many parts of Britain; but is seldom admitted into gardens.

(IV.) ANGELICA, USES OF THE, IN MEDICINE. For the purposes of medicine, Bohemia and Spain produce the best kinds of angelica. The London college directs the roots brought from Spain to be alone made use of. Angelica roots are apt to grow mouldy, and be preyed upon by insects, unless thoroughly dried, kept in a dry place, and frequently aired. It is probable that the roots which are subject to this inconvenience might be preserved, by dipping them in boiling spirit, or exposing them to its steam, after they are dried. All the parts of angelica, especially the root, have a true

a fragrant aromatic ſmell, and a pleaſant bitteriſh warm taſte, glowing upon the lips and palate for a long time after they have been chewed. The flavour of the ſeeds and leaves is very periſhable, particularly that of the latter, which, on being barely dried, loſe the greateſt part of their taſte and ſmell: the roots are more tenacious of their flavour, though even theſe loſe part of it upon keeping. The freſh root, wounded early in the ſpring, yields an odorous, yellow juice, which ſlowly exſiccated, proves an elegant gummy reſin, very rich in the virtues of the angelica. On drying the root, this juice concretes into diſtinct moleculæ, which, on cutting it longitudinally, appear diſtributed in little veins: in this ſtate, they are extracted by pure ſpirit, but not by watery liquors. —Angelica is one of the moſt elegant aromatics of European growth, though little regarded in the preſent practice. The root, which is the moſt efficacious part, is uſed in the aromatic tincture; and the ſtalks make an agreeable ſweet-meat.

(V.) ANGELICA WATER, a compound water, ſo called from the *angelica* root, which is the chief ingredient in the compoſition.

(VI.) ANGELICA, WILD. See ÆGOPODIUM.

(VII.) ANGELICA, in Grecian antiquity, a celebrated dance performed at their feaſts.—It was thus called, from ἄγγελος, *nuncius*, meſſenger; becauſe, as Pollux aſſures us, the dancers were dreſſed in the habit of meſſengers.

ANGELICÆ, or ANGELICS, a congregation of nuns, founded at Milan in 1534, by Louiſa Torelli, counteſs of Guaſtalla. They obſerve the rule of St Auguſtine.

* ANGELICAL. *adj.* [*angelicus*, Lat.] 1. Reſembling angels.—It diſcovereth unto us the glorious work of God, and carrieth up, with an *angelical* ſwiftneſs, our eyes, that our mind, being informed of his viſible marvels, may continually travel upward. *Raleigh.* 2. Partaking of the nature of angels.—

Others more mild
Retreated in a ſilent valley, ſing
With notes *angelical* to many a harp,
Their own heroic deeds. *Milton.*

3. Belonging to angels; ſuiting the nature or dignity of angels.—It may be encouragement to conſider the pleaſure of ſpeculations, which do raviſh and ſublime the thoughts with more clear *angelical* contentments. *Wilkins's Dædalus.*

* ANGELICALNESS. *n. ſ.* [from *angelical.*] The quality of being angelical; reſemblance of angels; excellence more than human.

ANGELICI. See ANGELICS.

* ANGELICK. *adj.* [*angelicus*, Lat.] Partaking of the nature of angels; angelical; above human.

Here happy creature, fair *angelick* Eve,
Partake thou alſo. *Milt. Par. Loſt.*

(1.) ANGELICS, ANGELICI, an order of knights, inſtituted in 1191, by Iſaac Angelus Commenus emperor of Conſtantinople.

(2.) ANGELICS, in church hiſtory, an ancient ſect of heretics, ſuppoſed by ſome to have got this appellation from their exceſſive veneration of angels; and by others, from their maintaining that the world was created by angels. See ANGELICÆ.

ANGELICUS PULVIS, a name given by Schroeder and others to *Mercurius vitæ*.

ANGELINA ZANONI ACOSTÆ, in botany. This is a tree of vaſt ſize, ſometimes above 1 feet thick, growing on rocky and ſandy places Malabar, in the Eaſt Indies. It bears ripe fru in December, and continues bearing for a whol century. The dried leaves heated, are ſaid to a leviate pains and ſtiffneſs in the joints, and diſcu an intumeſcence of the teſtes, occaſioned by contuſion, or any external violence; as alſo *hydrocele*, or *pneumatocele*. It is alſo efficacious venereal complaints and hæmorrhoidal fluxes.

ANGELIS, Dominico de, an Italian eccleſi tic, was born at Lecce, in the kingdom of Nap in 1675. Philip V. king of Naples, made him principal hiſtoriographer. He wrote ſeveral h ſt rical and biographical pieces of merit, in the I lian language; alſo ſome poems. He died in 17

ANGELITES, in eccleſiaſtical hiſtory, a ſ of Chriſtian heretics, in the reign of the empe Anaſtaſius, and the pontificate of Symmach about the year 494, ſo called from Angeliu where they held their firſt meetings. They w called likewiſe *Severites*, from Severus, who w the head of their ſect; as alſo *Theodoſians*, fr one among them named Theodoſius, whom th made pope at Alexandria. They held, that t perſons of the Trinity are not the ſame; t none of them exiſts of himſelf, and of his o nature; but that there is a common god or de exiſting in them all, and that each is God, b participation of this deity.

ANGELIUM. See laſt article.

ANGELO, Michael, the name of ſ celebrat Italian painters, who flouriſhed in the 16th a 17th centuries; but of whom we ſhall only m tion the two moſt diſtinguiſhed.

1. ANGELO, Michael, de Buonarrotti, wa moſt incomparable painter, ſculptor, and arc tect, born in 1474, in the territory of Arezzi Tuſcany. He was the diſciple of Dominico G landaio; and erected an academy of painting a ſculpture in Florence, under the patronage Lorenzo de Medicis; which, upon the troub of that houſe, he was obliged to remove to logna. About this time he made an image Cupid, which he carried to Rome, broke off of its arms, and buried the image in a place knew would ſoon be dug up, keeping the arm him. It was accordingly found, and ſold to C dinal St Gregory for an antique; until Micha to their confuſion and his own credit, diſcover his artifice, and confirmed it by the deficient which he produced. It is rather unuſual for manufacturers of antiques to be ſo ingenious. the deſire of Pope Paul III. he executed his celebrated picture of The laſt judgment. He the character of being the greateſt deſigner th ever lived; and it is univerſally allowed that painter ever underſtood anatomy better. He di immenſely rich at Rome, in 1564.

2. ANGELO, Michael, de Caravaggio, born that village in Milan, 1569. He was at firſt o a bricklayer's labourer: but he was ſo charm with ſeeing ſome painters at work, that he im diately applied himſelf to the art; and made ſu progreſs in a few years, that he was admired the author of a new ſtyle in painting. There one picture of his in the Dominican church

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Antwerp, which Rubens uſed to call his maſter. It is ſaid of this painter, that he was ſo ſtrangely contentious, that the pencil was no ſooner out of his hand, than his ſword was in it. He died in 1609.

ANGELO, St, the name of ſeveral places in Italy; viz. 1. a ſtrong caſtle at Rome, whither the Pope retires in times of danger: 2. a caſtle, and 3. a diſtrict of Corfu: 4. an impregnable caſtle in Malta: 5. a ſeaport town of Apulia, in the Gulf of Venice, 8 miles N. of Manfredonia: 6. a ſmall but ſtrong town in the Capitanata of Naples: Lon. 15. 56. E. Lat. 41. 42. N. 7. another town: 8. a city, and 9. a mountain in Naples: and, 10. a town in Urbino, belonging to the Pope.

ANGELOGRAPHY, [from ἀγγέλος and γράφω, I deſcribe,] a deſcription of angels, their orders, names, diſcipline, &c. Caſamanus and Manitius publiſhed Angelographies.

ANGELOLATRIA, [from ἀγγέλος, angel, and λάτρεια, I worſhip,] the ſuperſtitious worſhip, or adoration of angels.

ANGELOLOGY, [from ἀγγέλος and λόγος, diſcourſe,] the doctrine of angels, their nature, office, &c. Gerhard has publiſhed a ſacred Angelologia, Muſæus an apoſtolical Angelologia.

(1.) ANGELOS, Los, a province of Mexico, the ancient republic of Tlaſcala, of which a city called *Tlaſcala* was once the capital. That city is now reduced to an inconſiderable village, and has given place to another called *Puebla des los Angelos*, or the city of Angels. See next article.

(2.) ANGELOS, Los, the ſecond city of Mexico, was formerly an Indian town; but in 1530 was entirely abandoned by the natives, on account of the cruelty of the Spaniards. A ſucceeding viceroy of Mexico, by a milder treatment, recalled them; and the town is now exceedingly rich and populous, ſo as even to vie with Mexico itſelf in magnificence. It is ſituated on the river Zacatula, in a fine valley, about 25 leagues to the eaſtward of Mexico. In the middle is a beautiful and ſpacious ſquare, from whence run the principal ſtreets in direct lines, which are croſſed by others at right angles. One ſide is almoſt entirely occupied by the magnificent front of the cathedral; while the other three conſiſt of piazzas, under which are the ſhops of tradeſmen. The city is the ſee of a biſhop, ſuffragan to the archbiſhop of Mexico, and we may form a judgment of the wealth of the place by the revenue of the cathedral and chapter, which amounts to 300,000 pieces of eight annually. It muſt be remembered, however, that in all popiſh countries the wealth of the laity by no means bears the ſame proportion to that of the clergy, as in Britain. What contributes greatly to encreaſe the riches of this province is, that here is ſituated the city of Vera Cruz, that natural centre of all the American treaſures belonging to Spain. Lon. 103. 10. W. Lat. 19. 5. N.

ANGELOSOPHY, nearly the ſame with Angiology. A. Varenius publiſhed a work on angels, entitled *Angeloſophia*.

(1.) * ANGELOT. *n. ſ.* A muſical inſtrument, ſomewhat reſembling a lute. *Dict.*

(2.) ANGELOT, in coinage, an ancient Engliſh gold coin, ſtruck at Paris, while under ſubjection to the Engliſh. It was thus called from the figure of an angel ſupporting the ſcutcheon of the arms of England and France. There was another coin of the ſame denomination ſtruck under Philp de Valois.

(3.) ANGELOT, in commerce, a ſmall, fat, rich ſort of cheeſe, brought from Normandy. Skinner ſuppoſes it to have been thus called from the name of the perſon who firſt made it up in that form, and perhaps ſtamped it with his own name. Menage takes it to have been denominated from the reſemblance it bears to the Engliſh coin called *angelot*. It is made chiefly in the Pays de Bray, whence it is denominated *angelot de Bray*. It is commonly made in vats, either ſquare or ſhaped like a heart.

ANGELSLEY, a ſmall town in Somerſetſhire, near Taunton.

ANGELUS, Chriſtopher, a native of Greece, who, after ſuffering many hardſhips and cruelties from the Turks, came over to England, where he was well received. He taught Greek in the Univerſity of Oxford, and wrote ſeveral books; particularly an account of his own ſufferings, which is very intereſting. It was printed in Greek and Engliſh, in 1617. He died in 1638.

ANGELUS, in the church hiſtory of France, denotes a prayer to the Virgin, eſtabliſhed by Louis XI. to be rehearſed three times a day, at the ſound of a bell rung for that purpoſe! It is alſo called *Ave Maria*, or the angelic ſalutation. The late revolution aboliſhed all ſuch ſuperſtitions, and we do not ſuppoſe that the preſent Ruler will re-eſtabliſh them.

(1.) * ANGER. *n. ſ.* [a word of no certain etymology, but, with moſt probability, derived by *Skinner*, from *ange*, Sax. *vexed*; which, however, ſeems to come originally from the Latin *ango*.] 1. *Anger* is uneaſineſs or diſcompoſure of the mind, upon the receipt of any injury, with a preſent purpoſe of revenge. *Locke.*—

Anger is like
A full hot horſe, who being allow'd his way,
Self-mettle tires him. *Shakeſpeare.*

—*Anger* is, according to ſome, a tranſient hatred, or at leaſt very like it. *South.* 2. Pain, or ſmart, of a ſore or ſwelling. In this ſenſe it ſeems plainly deducible from *angor*.—I made the experiment, ſetting the moxa where the firſt violence of my pain began, and where the greateſt *anger* and ſoreneſs ſtill continued, notwithſtanding the ſwelling of my foot. *Temple.*

(2.) ANGER, REFLECTIONS UPON. Anger is either deliberative or inſtinctive; and the latter kind is raſh and ungovernable, becauſe it operates blindly, without affording time for deliberation or foreſight. Biſhop Butler juſtly obſerves, that anger is far from being a ſelfiſh paſſion, ſince it is naturally excited by injuries offered to others as well as to ourſelves; and was deſigned by the Author of nature not only to excite us to act vigorouſly in defending ourſelves from evil, but to intereſt us in the defence or reſcue of the injured and helpleſs, and to raiſe us above the fear of the proud and mighty oppreſſor. Neither, therefore, is all anger ſinful: hence the precept, "Be ye angry and ſin not."—It becomes ſinful, however, when it is conceived upon ſlight provocations,

and continues long. It is then contrary to the amiable ſpirit of charity, which "ſuffereth long, and is not eaſily provoked." Hence theſe other precepts, "Let every man be ſlow to anger;" and, "Let not the ſun go down upon your wrath." Such precepts ſuppoſe the paſſion of anger to be within our power. This power conſiſts not ſo much in any faculty we have of appeaſing our wrath at the time (for we are paſſive under the ſmart which an injury or affront occaſions, and all we can then do is to prevent its breaking out into action), as in ſo mollifying our minds by habits of juſt reflection, as to be leſs irritated by impreſſions of injury, and to be ſooner pacified.

(3.) ANGER, SEDATIVES OF. Mr Paley, in his excellent treatiſe of *Moral and Political Philoſophy*, ſuggeſts the following conſiderations, to allay this paſſion. "The poſſibility of miſtaking the motives, from which the conduct that offends us proceeded; how often *our* offences have been the effect of inadvertency, when they were miſtaken for malice; the inducement, which prompted our adverſary to act as he did; that he is perhaps under a contrition, which he is aſhamed to confeſs; that the returns of kindneſs are ſweet, and that there is neither honour, virtue, nor uſe, in reſiſting them; that others have their paſſions their prejudices, their favourite aims, their ſudden impulſes, as well as we; that we may recollect what hath ſometimes paſſed in our own minds, when on the wrong ſide of a quarrel, and imagine the ſame to be paſſing in our adverſary's mind; when we become ſenſible of our miſbehaviour, what palliations we perceived in it, and expected others to perceive; how we were affected by the kindneſs of a generous reception and ready forgiveneſs; how perſecution revived our enmity, and ſeemed to juſtify the conduct in ourſelves which we before blamed; add to this, the indecency of extravagant anger; how it renders us, while it laſts, the ſcorn of all about us; of which it leaves us, when it ceaſes, ſenſible and aſhamed; the inconveniences into which it has ſometimes betrayed us; the friendſhip it has loſt to us; the embarraſſments in which we have been involved by it, and the repentance, which, on one account or other, it always coſts us. But the reflection, calculated, above all others, to allay anger, is, that we ourſelves are, or ſhall be, ſuppliants for mercy and pardon, to the judgment ſeat of God. Imagine our ſecret ſins all diſcloſed; imagine us thus humbled, trembling under the hand of God; caſting ourſelves on his compaſſion; crying out for mercy—imagine ſuch a creature to talk of revenge, refuſing to be intreated, diſdaining to forgive, extreme to reſent what is done amiſs; and you can hardly feign to yourſelf, an inſtance of more impious, and unnatural arrogance."

(4.) ANGER, VIOLENT, SURPRISING EFFECTS OF. Phyſicians and naturaliſts afford inſtances of very extraordinary effects of this paſſion. Borrichius cured a woman of an inveterate tertian ague, which had baffled the art of phyſic, by putting the patient in a furious fit of anger. Valerius made uſe of the ſame means, with the like ſucceſs, in a quartan ague. The ſame paſſion has been equally ſalutary to paralytic, gouty, and even dumb perſons; to which laſt it has ſometimes given the uſe of ſpeech. Etmuller gives divers inſtances of very ſingular cures wrought by anger; among others, he mentions a perſon laid up in the gout, who, being provoked by his phyſician, flew upon him, and was cured. It is true, the remedy is ſomewhat dangerous in the application, when a patient does not know how to uſe it with moderation. We meet with ſeveral inſtances of princes, to whom it has proved mortal; *e.g.* Valentinian I. Wenceſlaus, Matthias Corvinus king of Hungary, and others. There are alſo inſtances, wherein it has produced the epilepſy, jaundice, cholera morbus, diarrhœa, &c. In fact, this paſſion is of ſuch a nature, that it quickly throws the whole nervous ſyſtem into preternatural commotions, by a violent ſtricture of the nervous and muſcular parts; and ſurpriſingly augments, not only the ſyſtole of the heart, and of its contiguous veſſels, but alſo the tone of the fibrous parts in the whole body. It is alſo certain, that this paſſion, by the ſpaſmodic ſtricture it produces in the parts, exerts its power principally on the ſtomach and inteſtines, which are highly nervous and membranous parts; whence the ſymptoms are more dangerous, in proportion to the greater conſent of the ſtomach and inteſtines, with the other nervous parts, and almoſt with the whole body. The unhappy influence of anger likewiſe, on the biliary and hepatic ducts, is very ſurpriſing; ſince, by an intenſe conſtriction of theſe, the liver is not only rendered ſchirrous, but ſtones alſo are often generated in the gall bladder and biliary ducts: theſe accidents have ſcarcely any other origin than an obſtruction of the free motion and efflux of the bile, by means of this violent ſtricture.—From ſuch a ſtricture, likewiſe, proceeds the jaundice, which, in proceſs of time, lays a foundation for calculous concretions in the gall bladder. By increaſing the motion of the fluid, or the ſpaſms of the fibrous parts, by means of anger, a larger quantity of blood is forcibly propelled to certain parts; whence it happens, that they are too much diſtended, and the orifices of the veins diſtributed there, opened. It is evident from experience, that anger has a great tendency to excite enormous hæmorrhagies, either from the noſe, the aperture, of the pulmonary artery the veins of the anus; or in women, from the uterus, eſpecially in thoſe previouſly accuſtomed to ſuch evacuations.

* *To* ANGER. *v. a.* [from the noun] 1. To make angry; to provoke; to enrage.—Who would *anger* the meaneſt artiſan, which carries a good mind? *Hooker.* 2. To make painful.—He turneth the humours back, and maketh the wound bleed inwards, and *angereth* malign ulcers and pernicious impoſthumations. *Bacon.*

ANGERAP, a river of Pruſſia, which, uniting with the Inſter, near Inſterburg, forms the navigable river, Pregel.

ANGERBURG, the name of 1. a diſtrict of Pruſſia; 2. a lake, from which the Angerap riſes; and 3. a well built town of Pruſſia, ſurrounded with paliſades, which has a ſtrong caſtle, built in 1335, on the lake.

* ANGERLY. *adj.* [from *anger*.] In an angry

gry manner; like one offended; it is now written *angrily*.—Such jeſter's diſhoneſt indiſcretion, is rather charitably to be pitied, than their exception either *angerly* to be grieved at, or ſeriouſly to be confuted. *Cureau*.

1.) ANGERMANNIA, a province in the N. of Sweden, bounded on the N. by Lapland and Bothnia, on the E. by the Gulph of Bothnia and Medelpadia, and on the W. by Jemti and Herneſ. It is 24 miles long, and 16 broad; is full of rocks, mountains, and foreſts; and has excellent iron works, and lakes abounding with fiſh.

(2.) ANGERMANNIA, a river of Sweden.

ANGERMANNSLAND, or ASELELAPPMARK, a province of Lapland, bounded on the E. by Angermannia, on the N. by Umea Lappmark, on the W. by the mountains, and on the S. by Jemtland.

ANGERMOND, or } a town of the duchy of
ANGERMUNDE, } Berg, in Germany, on the E. ſide of the Rhine, 9 miles N. of Duſſeldorff, ſubject to the Elector Palatine. Lon. 6. 20. E. Lat. 51. 10. N.

ANGERN, an iron work in Courland.

ANGERONA, in mythology, the name of a pagan deity, to whom the Romans prayed for the cure of the quinzy; in Latin, *angina*. Pliny calls her the goddeſs of ſilence and calmneſs of mind, who baniſhes all uneaſineſs and melancholy. She is repreſented with her mouth covered, to denote patience, and refraining from complaints. Her ſtatue was ſet up, and ſacrificed to, in the temple of the goddeſs Volupia, to ſhow that a patient enduring affliction leads to pleaſure.

ANGERONALIA, in antiquity, ſolemn feaſts held by the Romans the 21ſt of December, in honour of Angerona, or Angeronia, the goddeſs of patience and ſilence. Feſtus and Julius Modeſtus, quoted by Macrobius, derive the name from *angina*, the quinzy; and ſuppoſe the goddeſs to have been thus denominated, becauſe ſhe preſided over that diſeaſe. Others ſuppoſe it formed from *angor*, grief, pain; to intimate that ſhe gave relief to thoſe afflicted therewith. Others deduce it from *angeo*, I cloſe, as being related the goddeſs of ſilence, &c.

ANGERS, a great city of France, in the department of Maine and Loire, ſituated near the confluence of the Sarte, the Loire and Maine, 45 miles E. of Nantz. This laſt river divides the city into two equal parts. There are 12 pariſhes in it, and 4 in the ſuburbs, which contain towards of 9000 houſes, and 36,000 inhabitants. Its greateſt extent is along the declivity of a hill, which reaches down to the river ſide.—The caſtle was built by St Louis, about the middle of the 13th century. The walls, foſſes, and numerous towers which yet ſubſiſt, evince its former magnificence; and its ſituation in the center of the city, on a rock overhanging the river, gives it an air of grandeur. It was formerly the principal reſidence of the kings of Sicily, as dukes of Anjou. The cathedral is a venerable ſtructure. Herſelf lies interred with her anceſtors the renowned Margaret, daughter of Rene king of Sicily, and queen of Henry VI. of England. She expired, after many intrepid, but ineffectual efforts, to replace her huſband on the throne, in 1482, at the caſtle of Dampierre. Near the church of St Michael is the handſomeſt ſquare in the city, from whence runs a ſtreet of the ſame name. On one ſide of this ſtreet is the town-houſe; which has a fine tower, with a clock, raiſed upon an arch, that ſerves for a paſſage into the great ſquare.—There are two large bridges, which keep up a communication between the two parts of the city: and in the leſſer of theſe there is another ſquare, which ſerves for a market. The univerſity of Angers was founded in 1398, and the academy of Belles lettres in 1685. This laſt conſiſts of 30 academicians. At the end of the ſuburbs of Breſigny are the quarries of Angiers, famous for fine ſlates, of the thickneſs of a crown piece, and a foot ſquare. All the houſes in Angers are covered with this ſlate, which has gained it the appellation of the *Black City*. The walls, with which king John of England ſurrounded it in 1214, remain nearly entire, and are of very great circumference. Lon. 0. 30. W. Lat. 47. 28. N.

ANGERTON, two Engliſh villages; viz. 1. in the Holme, Cumberland: 2. near Morpeth.

ANGETENAR, in the Arabian aſtronomy, denotes a fixed ſtar of the 4th magnitude, in the body of Cetus, or the whale.

ANGEZIA, one of the Comora iſlands.

ANGHIART, a village of Tuſcany.

ANGHIERA, 1. a county of Italy, in the duchy of Milan; and 2. a town, the capital of that county; ſeated on the eaſtern ſide of the lake Maggiore. Lon. 9. 5. E. Lat. 45. 42. N.

ANGI, among phyſicians, thoſe tumours in the groin, called buboes.

ANGIER, Samuel, a non-conformiſt divine, born at Dedham in Eſſex, and bred at Emanuel College, Cambridge. He was ſettled as miniſter at Denton in Lancaſhire, where he continued till he was ejected by the act of uniformity, in 1662. He died in 1677, aged 72. He wrote a treatiſe concerning the worſhip of God, entitled, "A Help to better Hearts for better Times."

ANGIGLOSSI, [from ἀγχω, to lie ſtrait, and γλωσσα, the tongue,] denotes thoſe who ſpeak with heſitation or ſtammering.

ANGILDUM, in ancient authors, [from *an*, one, and *gild*, price, Sax.] a ſimple gild, that is, the ſimple value of any thing. It is diſtinguiſhed from *twigildum*, a *double compenſation*; *trigildum*, a *triple compenſation*.

ANGINA, in medicine, violent inflammation of the throat, otherwiſe called *quinzy*. See MEDICINE, INDEX.

ANGINA GANGRENOSA, or *aquoſa*, the ulcerated, malignant, putrid ſore throat: on which there are various treatiſes by Fothergil, Huxham, Northcoat, &c.

ANGINA LINI, in botany, a name uſed by ſome of the later Greek writers to expreſs what the more ancient writers of this nation called *linozotis*, and the Latins *epilinum*; this was the cuſcuta or dodder growing on the flax, as that on the thyme was called *epithymum*. It was called *angina lini*, the quinzy of flax, from its choaking that plant.

ANGINA PECTORIS. See MEDICINE, INDEX.

* ANGIOGRAPHY. *n. ſ.* [from ἀγγειον and γραφω.] A deſcription of veſſels in the human body: nerves, veins, arteries, and lymphaticks.

ANGIOLELLO,

ANGIOLELLO, John, an hiſtorian, was born at Vicenza. Being taken captive by the Turks, he was made ſlave to ſultan Muſtapha, whom he accompanied in an expedition to Perſia, in 1573. He wrote the hiſtory of Mahomet II. in the Italian and Turkiſh languages; alſo the hiſtory of Uſſun Caſſon.

* ANGIOLOGY. *n. ſ.* [from ἀγγεῖον and λογία.] A treatiſe or diſcourſe of the veſſels of a human body.

* ANGIOMONOSPERMOUS. *adj.* [from ἀγγεῖον μονος, and σπερμα.] Such plants as have but one ſingle ſeed in the ſeed-pod.

ANGIOSPERMIA, in the Linnæan ſyſtem of botany, the ſecond order in the claſs Didynamia. It conſiſts of thoſe plants, of that claſs, whoſe ſeeds are incloſed in a pericarpium. In this order the ſtigma is generally obtuſe. Theſe are the perſonati of Tournfort.

* ANGIOTOMY. *n. ſ.* [from ἀγγεῖον and τεμνω, to cut.] A cutting open of the veſſels, as in the opening of a vein or artery.

ANGITIA, the ſiſter of Medea, who taught antidotes againſt poiſon and ſerpents, according to Sil. Italicus; though Servius on Virgil ſays that Medea herſelf got this name for the ſame reaſon.

ANGITIÆ LUCUS, or NEMUS, in ancient geography, a town of Naples ſituated on the W. ſide of the Lacus Fucinus, now called LUCO.

ANGLARS, a town of France, in the department of Puys-de-dome.

(1.) * ANGLE. *n. ſ.* [*angle*, Fr. *angulus*, Lat.] The ſpace intercepted between two lines interſecting or meeting, ſo as, if continued, they would interſect each other. *Angle of the centre of a circle*, is an *angle* whoſe vertex, or angular point, is at the centre of a circle, and whoſe legs are two ſemidiameters of that circle. *Stone's Dict.*

(2.) * ANGLE. *n. ſ.* [*angle*, Germ. and Dutch.] An inſtrument to take fiſh, conſiſting of a rod, a line, and a hook.—

The patient fiſher takes his ſilent ſtand,
Intent his *angle* trembling in his hand;
With looks unmov'd, he hopes the ſcaly breed,
And eyes the dancing cork, and bending reed.
Pope.

(3.) ANGLE is otherwiſe defined the inclination of two lines meeting one another in a point. See GEOMETRY.

(4.) ANGLE, in geography, a town of France, in the department of Vienne, ſeated on the Anglin, 22 miles from Poitiers.

ANGLE, ACUTE, CURVILINEAL, RECTILINEAL, &c. See GEOMETRY.

ANGLE OF DIRECTION, ELEVATION, &c. See MECHANICS.

ANGLE OF INCIDENCE, in optics, the angle which a ray of light makes with a perpendicular to that point of the ſurface of any medium on which it falls; though it is ſometimes underſtood of the angle which it makes with the ſurface itſelf.

ANGLE OF LONGITUDE, in aſtronomy, the angle which the circle of a ſtar's longitude makes with the meridian at the pole of the ecliptic.

ANGLE OF PARALLAX, in aſtronomy, the angle made by two lines ſuppoſed to be drawn from the centre of [illegible] the ſurface of the earth.

ANGLE OF REFRACTION now generally means the angle which a ray of light, refracted by any medium, which makes a perpendicular to that point of the ſurface on which it was incident; but has ſometimes been underſtood of the angle which it makes with the ſurface of the refracting medium itſelf.

ANGLE OF THE TENAILLE, POLYGON, &c. &c. See FORTIFICATION.

* *To* ANGLE. *v. n.* [from the noun.] 1. To fiſh with a rod and hook.—

The ladies *angling* in the cryſtal lake,
Feaſt on the waters with the prey they take.
Waller.

2. To try to gain by ſome inſinuating artifices, as fiſhes are caught by a bait.—If he ſpake courteouſly, he *angled* the people's heart: if he were ſilent, he muſed upon ſome dangerous plot. *Sidney.*—

The pleaſant'ſt angling is to ſee the fiſh
Cut with her golden oars the ſilver ſtream,
And greedily devour the treacherous bait;
So *angle* we for Beatrice. *Shakſpeare.*

* ANGLE ROD. *n. ſ.* [*angle roede*, Dutch.] The ſtick to which the line and hook are hung.—It differeth much in greatneſs; the ſmalleſt being uſed for thatching of houſes; the ſecond bigneſs uſed for *angle-rods*; and in China, for beating offenders upon the thighs. *Bacon.*

(1.) * ANGLER. *n. ſ.* [from *angle*.] He that fiſhes with an angle.—

He, like a patient *angler*, ere he ſtrook,
Would let them play a while upon the hook.
Dryden.

(2.) ANGLER, in ichthyology, the Engliſh name of a ſpecies of lophus. See LOPHUS.

(1.) ANGLES, an ancient German nation, originally a branch of the Suevi; who, after various migrations, ſettled in that part of Denmark, and duchy of Sleſwick, which to this day is called *Angel*, and of which the city of Flenſbourg is the capital. Here they were known, even in the time of Tacitus, by the name of *Angli*. The origin of this name is variouſly accounted for. According to Saxo-Grammaticus, they were called *Anglı* from one Angulus, ſon to Humblus, king of Denmark. Widiſchind, a Saxon writer, will have them to be called *Angli*, from an iſland in the corner or angle of the ſea, which they conquered. Goropius derives their name from the Saxon word *Angel* or *Engel*, ſignifying a fiſh-hook; the Angles, like the other Saxon nations, being greatly addicted to piracy, and on that account being ſo named by the neighbouring nations; for if like hooks, they caught all that was in the ſea. To this nation the Britiſh ambaſſadors are ſaid to have applied when ſoliciting ſuccours againſt the Scots and Picts. The Angles therefore came over in greater numbers than any other Saxon nation; and accordingly had the honour of giving the name of *Anglia* to England. See ENGLAND.

(2.) ANGLES, a town of France, in the department of Tern, near Caſtres, ſeated on a mountain near the river Agout.

(3.) ANGLES, in aſtrology, denote certain houſes of a figure, or ſcheme of the heavens. The the horoſcope of the houſe is termed the angle the eaſt.

ANGLESBOROUGH, a small town of Ireland, in Limerick.

(1.) ANGLESEY, Isle of, the most western county of North Wales. It is 24 miles in length, 18 in breadth, and about 230 from London. It is separated from Caernarvonshire by a strait called *Menai*, and on every other side is surrounded by the sea. It is a fertile spot, and abounds in corn, cattle, flesh, fish, and fowls.

(1.) ANGLESEY, ANCIENT ACCOUNTS OF. In ancient times this island was called *Mon*, *Mona*, or *Kieg*. It was the great nursery of the religion of the Druids; being the residence of the Grand Druid, or chief pontiff, and consequently of all the learned doctors in that religion. Many ancient monuments of Druidism still remain in the island. At Tre'r Dryw, or the habitation of the arch druid, are several mutilated remains, which have been described by Mr Rowlands. His *Bryn Gwyn*, or *Brein Gwyn*, or royal tribunal, is a circular hollow of 180 feet in diameter, surrounded by an immense agger of earth and stones, evidently brought from some other place, there not being any mark of their being taken from the spot. It has only a single entrance. This is supposed to have been the grand consistory of the druidical administration.—Not far from it was one of the *Carneddau*, now in a manner dispersed, but which once consisted of a great copped heap of stones, on which sat aloft a druid, instructing the surrounding people *multa de Deorum immortalium vi & potestate disputare, et juventuti tradunt;* Cæs. lib. 6.—Here were also the relics of a circle of stone, with the *cromlech* in the midst; but all extremely imperfect. Two of the stones are very large; one, which serves at present as part of the end of a house, is 12 feet 7 inches high and 8 feet broad; and another 11 feet high and 23 feet in girth. Some lesser stones yet remain. This circle, when complete, was one of the temples of the druids, in which their religious rites were performed. It is the conjecture of Mr Rowlands, that the whole of these remains were surrounded with a circle, of oaks, and formed a deep and sacred grove. Near this is *Caer Lêb*, or the moated entrenchment; of a square form, with a double rampart, and broad ditch intervening, and a less on the outside. Within are foundations of circular and of square buildings. This Mr Rowland supposes to have been the residence of the arch druid, and to have given the name, *Tre'r Dryw*, to the township in which it stands. At Trev-Wry are several faint traces of circles of stone, and other vestiges of buildings; but all so dilapidated, or hid in weeds, as to become almost formless. *Bod-drudan* or the habitation of the druids, *Tre'r Beirdd* or that of the bard, and *Bodowyr* or that of the priests, are all of them hamlets, nearly surrounding the seat of the chief druid, composing the essential part of his suit. At the last is a thick cromlech, resting on three stones. The shore near Porthamel, not far from hence, is famed for being the place where Suetonius landed, and put an end in this island to the druid reign. His infantry passed over in flat-bottom boats, perhaps at the spot still called *Pant yr Yscraphie*, or the valley of *Skiffs*. His cavalry crossed partly by fording, partly by swimming. Of the conflict on this occasion, we have an animated description by Tacitus; of which, for brevity's sake, we shall only give the translation: On the shore stood a motley army in close array, and well armed; with women running wildly about in black attire with dishevelled hair, and like the furies brandishing their torches; surrounded by the druids, lifting up their hands to heaven, and pouring forth the most dreadful imprecations. The soldier stood astonished with the novelty of the sight. His limbs grew torpid, and his body remaining motionless resigned to every wound. At length, animated by their leader, and rouzing one another not to be intimidated with a womanly and fanatic band, they displayed their ensigns, overthrew all who opposed them, and flung them into their own fires. After the battle, they placed garrisons in the towns, and cut down the groves consecrated to the most horrible superstitions: for the Britons held it right to sacrifice on their altars with the blood of their captives, and to consult the gods by the inspection of human entrails."—There are no traces of any Roman works left in this country. Their stay was so short, that they had not time to form any thing permanent.

(3.) ANGLESEY, ANCIENT BUILDINGS IN. At a small distance from Beaumaris, on the shore, stand the remains of Llanvaes, or the Friars. It was founded by Prince Llewellyn ap Jerwerth, and, according to the general tradition of the country, over the grave of his wife Joan, daughter of King John, who died in 1237, and was interred on the spot. Here also were interred a son of a Danish king, Lord Clifford, and many barons and knights who fell in the Welsh wars. It was dedicated to St Francis, and consecrated by Howel bishop of Bangor, a prelate who died in 1240. The religious were Franciscans, or minor friars. Their church and house were destroyed, and their lands wasted, in the insurrection made soon after the death of Llewellyn, the last Welch prince, by his relation Madoc. Edward II. in consideration of their misfortunes, remitted to them the payment of the taxes due to him, which before the war were levied at the rate of L. 12. 10 s. These friars were strong favourers of Glendowr. Henry, in his first march against Owen, plundered the convent, put several of the friars to the sword, and carried away the rest; but afterwards set them at liberty, made restitution to the place, but peopled it with English recluses. It possibly was again reduced to ruin; for Henry V. by patent, establishes here eight friars, but directs that two only should be Welsh. At the dissolution, Henry VIII. sold the convent and its possessions to one of his courtiers. They became in later days the property of a family of the name of *White* now extinct, who built here a good mansion. It became of late, by purchase, the property of Lord Bulkeley. The church is turned into a barn, and the coffin of the princess Joan now serves for a watering trough.—A little farther is Castell Aber Lliennawg, a small square fort, with the remains of a little round tower at each corner. In the middle one stood a square tower. A foss surrounds the whole. A hollow way is carried quite to the shore, and at its extremity is a large

a larg mound of earth, defigned to cover the landing. This caſtle was founded by Hugh Lupus Earl of Cheſter, and Hugh the Red Earl of Shrewſbury, in 1098, where they made an invaſion, and committed more ſavage barbarities on the poor natives, eſpecially on one Kenred a prieſt, than ever ſtained the annals of any country. Providence ſent Magnus king of Norway to revenge their cruelties. His coming was to all appearance caſual. He offered to land, but was oppoſed by the earls. Magnus ſtood in the prow of his ſhip, and calling to him a moſt expert bowman, they at once directed their arrows at the Earl of Shrewſbury, who ſtood fully armed on the ſhore. An arrow pierced his brain through one of his eyes, the only defenceleſs part. The victor, ſeeing him ſpring up in the agonies of death, inſultingly cried out, in his own language, *Leit loupe*, "Let him dance." This fort was garriſoned ſo lately as the time of Charles I. when it was kept for the parliament by Sir Thomas Cheadle; but was taken by Colonel Robinſon in 1645. Above Llanddona is a high hill, called *Bwrdd Arthur*, or Arthur's round table: the true name was probably *Din*, or *Dinas Sulwy*; for a church immediately beneath bears that of *Llanvihangle Din-Sulwy*. On the top of it is a great Britiſh poſt, ſurrounded by a double row of rude ſtones with the ſharp points uppermoſt; and in ſome parts the ramparts are formed of ſmall ſtones. In the area are veſtiges of oval buildings: the largeſt is formed with two rows of flat ſtones ſet on end. Theſe had been the temporary habitations of the poſſeſſors. It had been a place of vaſt ſtrength; for, beſides the artificial defence, the hill ſlopes ſteeply on all ſides, and the brink next to the ramparts are moſtly precipitous. It is worth while to aſcend this hill for the ſake of the vaſt proſpect; an intermixture of ſea, rock, and alps, moſt ſavagely great. About two miles ſouth of Plas Gwyn, the ſeat of Paul Panton, Eſq; was ſituated Penmynnydd, once the reſidence of the anceſtors of Owen Tudor, ſecond huſband to Catherine of France, queen dowager of Henry V. a marriage which reſtored the Britiſh race of princes to this kingdom: the mixed race having ceaſed on the acceſſion of Henry VII. grandſon to Owen Tudor, the lineal deſcendant of Cadwalader, the laſt king of the Britons. The remains of the reſidence of the Tudors are, the door of the gateway: part of the houſe, and the great chimney piece of the hall, are to be ſeen in the preſent farm houſe. Some coats of arms, and dates of the building or time of repairs, are to be ſeen, with the initial letters of the names of the owners. The Tudors, for a conſiderable ſpace before the extinction of their race, aſſumed the name of *Owen*. Richard was the laſt male of the family, and was ſheriff of the county in 1657. Margaret, heireſs of the houſe, married Coningſby Williams, Eſq; of Glan y gors, in this iſland, who poſſeſſed it during his life. It was afterwards ſold to Lord Bulkeley, in whoſe deſcendant it ſtill continues. In the church of Penmynnydd is a moſt magnificent monument of white alabaſter, removed at the diſſolution from the abby of Llanvaes to this place; probably erected in memory of one of the houſe of Tudor, who had been interred there. On it is the figure of a man in complete armour, a conic helm, and mail guard down to his breaſt; his lady is in a thick angular hood; their feet reſt on lions, and their heads are ſupported by angels. On the weſtern point of the bay is a ſmall cape, flat at top, called *Caſtell-mawr*, joined to the land by a low iſthmus. It is compoſed of lime-ſtone, which is carried to diſtant parts in ſmall veſſels, which lie in a ſmall channel near the rock, and by their numbers frequently enliven the view. Roman coins have been found in this neighbourhood; but there are no veſtiges of their having been any ſtation.

(4.) ANGLESEY, CATTLE AND PRODUCE OF. At Port Aethwy, the moſt general ferry into the iſland, there is a great paſſage of cattle. It is computed that the iſland ſends forth annually from 12,000 to 15,000 heads, and multitudes of ſheep and hogs. It is alſo computed that the remaining ſtock of cattle is 30,000. In 1770 upwards of 90,000 buſhels of corn were exported, excluſive of wheat. The improvement in huſbandry has greatly increaſed ſince the ſuppreſſion of ſmuggling from the Iſle of Man: before that time every farmer was mounted on ſome high promontory, expecting the veſſel with illicit trade; but ſince that period, he ſets in earneſt to induſtry and cultivation. Not but that the iſland was in moſt remote time famous for its fertility: Mon-Mam Gymry, the Nurſing mothers of Wales, was a title it aſſumed even in the 12th century.

(5.) ANGLESEY, COPPER MINES OF. At Tryſclwyn mountain is the moſt conſiderable body of copper ore perhaps ever known. The part of Tryſclwyn which contains it is called *Parys mountain*. Of this mountain, and the works there carried on, we have the following very curious and particular account by Mr Pennant:—"The external aſpect of the hill is extremely rude, and riſes into enormous rocks of coarſe white quartz. The ore is lodged in a baſon, or hollow, and has on one ſide a ſmall lake, on whoſe waters, diſtaſteful as thoſe of Avernus, no bird is known to alight. The whole aſpect of this tract has, by the mineral operations, aſſumed a moſt ſavage appearance. Suffocating fumes of the burning heaps of copper ariſe in all parts, and extend their baneful influence for miles around. In the adjacent parts vegetation is nearly deſtroyed; even the moſſes and lichens of the rocks have periſhed; and nothing ſeems capable of reſiſting the fumes but the purple melic graſs, which flouriſhes in abundance. It is thought that the ore had been worked in a very diſtant period. Veſtiges of the ancient operations appear in ſeveral parts, carried on by trenching, and by heating the rocks intenſely, then ſuddenly pouring on water, ſo as to cauſe them to crack or ſcale; thus awkwardly ſupplying the uſe o. gun-powder. Pieces of charcoal were alſo found, which proves that wood was made uſe of for that purpoſe. As the Britons imported all works in braſs, it is certain that the Romans were the undertakers of theſe mines; and it is very probable that they ſent the ore to Caerhên to be ſmelted, the place where the famous cake of copper was diſcovered. They might likewiſe have had a ſmelting-hearth in this iſland;

ſland; for a round cake of copper was diſcovered at Llanvaethlle, a few miles from this place. Its weight was fifty pounds, and it had on it a mark reſembling an *L*. "In 1762, one Alexander Frazier came into Angleſey in ſearch of mines. He viſited Parys mountain; called on Sir Nicholas Bayley, and gave him ſo flattering an account of the proſpect, as induced him to make a trial, and ſink ſhafts. Ore was diſcovered; but before any quantity could be gotten, the mines were overpowered with water. In about two years after, Meſſrs Roe and Co. of Macclesfield applied to Sir Nicholas for a leaſe of Penryn ddu mine in Carnarvonſhire; with which they were, much againſt their wills, compelled to take a leaſe of part of this mountain, and to carry on a level to make a fair trial. The trial was accordingly made; ore was diſcovered; but the expences overbalanced the profits. They continued working at great loſs; and at length determined to give the affair up. They gave their agent orders for that purpoſe; but he, as a final attempt, divided his men into ten ſeveral companies, of three or four in a partnerſhip, and let them ſink ſhafts in various places, about 800 yards eaſtward of a place called the *Golden Venture*, on a preſumption that a ſpring, which iſſued from near the place, muſt come from a body of mineral. His conjecture was right; for in leſs than two days they met with, at the depth of ſeven feet from the ſurface, the ſolid mineral, which proved to be that vaſt body which has ſince been worked to ſuch advantage. The day that this diſcovery was made was March 2d, 1768; which has ever ſince been obſerved as a feſtival by the miners. Soon after this diſcovery, another adventure was begun by the reverend Mr Edward Hughes, owner of part of the mountain, in right of his wife Mary Lewis of Llys Dulas; ſo that the whole of the treaſure is the property of Sir Nicholas Bayley and himſelf. The body of copper ore is of unknown extent. The thickneſs has been aſcertained in ſome places by the driving of a level under ſeveral years ago, and it was found to be in ſome places twenty four yards. The ore is moſtly of the kind called by Cronſted *Pyrites cupri flavi virideſcens*, and contains vaſt quantities of ſulphur. It varies in degrees of goodneſs: ſome of it is rich, but the greater part poor in quality. There are other ſpecies of copper ore found here. Of late a vein of the *Pyrites cupri griſeus* of Cronſted, about ſeven yards wide, has been diſcovered near the weſt end of the mountain: ſome is of an iron grey, ſome quite black; the firſt contains 15 lb. of copper per 100 lb, the laſt forty. An ore has been lately found, in form of looſe earth, of a dark purpliſh colour; and the beſt of it has produced better than eight in twenty. Some years ago, above 30 lb. of native copper was found in driving a level through a turbery; ſome was in form of moſs, ſome in very thin leaves. It is quarried out of the bed in vaſt maſſes; is broken into ſmall pieces; and the moſt pure part is ſold raw, at the rate of about 3 *l.* to 6 *l.* per ton, or ſent to the ſmelting-houſes of the reſpective companies to be melted into metal. Mr Hughes has great furnaces of his own at Ravenhead, near Liverpool, and at Swanſey, in South Wales. An idea of the wealth of theſe mines may be formed by conſidering that the Macclesfield company have had at once 14,000, tons of ore upon bank, and Mr Hughes 30,000.

(6.) ANGLESEY COPPER MINES, MANNER OF WORKING. "The impure ore is broken to about the ſize of hens eggs; but to clear it from the quantity of ſulphur with which it abounds, as well as other adventitious matter, it muſt undergo the operation of burning. For that purpoſe it is placed between two parallel walls of vaſt length: ſome kilns are 30, others 40, and 50 yards in length: ſome 10, others 20, feet wide and above 4 feet in height. The ſpace between is not only filled, but the ore is piled many feet higher, in a convex form, from end to end. The whole is then covered with flat ſtones, cloſely luted with clay; and above is placed a general integument of clay, and ſmall rubbiſh of the work, in order to prevent any of the fumes from evaporating. Of late, ſome kilns have been conſtructed with brick arches over the ore, which is found to be the beſt method of burning. Within theſe few years, attempts have been made to preſerve the ſulphur from flying away; and that is done by flues made of brick, whoſe tops are in form of a Gothic arch, many ſcores of feet in length. One end of theſe opens into the beds of copper which are to be burnt. Thoſe beds are ſet on fire by a very ſmall quantity of coal, for all the reſt is effected by its own phlogiſton. The volatile part is confined, and directed to the flues; in its courſe the ſulphureous particles ſtrike againſt their roofs, and fall to the bottom in the form of the fineſt brimſtone: which is collected and carried to adjacent houſes, where it is melted into what is called in the ſhops *ſtone brimſtone*. The beds of copper, thus piled for burning, are of vaſt extent. Some contain 400 tons of ore, others 2000. The firſt require four months to be completely burnt, the laſt near ten. Thus burnt, it is carried to proper places to be dreſſed, or waſhed, and made merchantable. By this proceſs the ore is reduced to a fourth part in quantity, but conſiderably improved in quality: and by this means the water is ſtrongly or richly impregnated with copper, which is diſſolved by the acid quality of the ſulphur: and is collected or precipitated again by iron in the above-deſcribed pits. The iron is all diſſolved. But a far richer produce of copper is recovered from the water lodged in the bottom of the bed of ore which is highly ſaturated with the precious metal. This is drawn up, either by means of whimſies or wind mills, to the ſurface, and then diſtributed into numbers of rectangular pits 36 feet long, ſome pits more ſome leſs, 12 to 15 feet broad and 20 inches deep. To ſpeak in the language of the adepts, *Venus* muſt make an aſſignation with *Mars*, or this ſolution will have no effect. In plain Engliſh, a quantity of iron muſt be immerſed in the water. The kind of iron is of no moment; old pots, hoops, anchors, or any refuſe will ſuffice; but of late, for the convenience of management, the adventurers procure new plates, four feet long, one and a half broad, and three quarters of an inch thick. Theſe they immerſe into the pits. The particles of copper inſtantly are precipitated by the iron, and the iron

is gradually diſſolved into a yellow ocher. Great part of it flows off by the water, and ſinks to the bottom. The plates, or the old iron (as it happens), are frequently taken out, and the copper ſcraped off; and this is repeated till the whole of the iron is conſumed. The copper thus procured differs little from native copper, and is prized accordingly, and ſold for prices of L 25. to L 45. a ton. This diſcovery is far from new: it has been practiſed long in the Wicklow mines in Ireland; and above a century in thoſe of Hern-grundt in Hungary, where it is called *zinent copper*. The waters of the Hungarian mines are much more ſtrongly impregnated with copper than thoſe of Parys-mountain. The firſt effects its operation in about 12 or 20 days, the laſt requires 2 months. Horſe ſhoes, iron made in ſhape of hearts, and other forms, are put into the foreign waters: and when perfectly tranſmuted, are given as preſents to curious ſtrangers. The ore is not got in the common manner of mining, but is cut out of the bed in the ſame manner as ſtone is out of a quarry. A hollow is now formed in the ſolid ore open to the day, and extends about 100 yards in length, about 40 yards in breadth, and 24 yards in depth. The ends are at preſent undermined, but ſupported by vaſt pillars and magnificent arches, all metallic; and theſe caverns meander far under ground. Theſe will ſoon diſappear, and thouſands of tons of ore be gotten from both the columns and roofs. The ſides of this vaſt hollow are moſtly perpendicular, and acceſs to the bottom is only to be had by ſmall ſteps cut in the ore; and the curious viſitor muſt truſt to them and a rope, till he reaches ſome ladders, which will conduct him the reſt of the deſcent. On the edges of the chaſms are wooden platforms, which project far; on them are windlaſſes, by which the workmen are lowered to tranſact their buſineſs on the face of the precipice. There ſuſpended, they work in mid air, pick a ſmall ſpace for a footing, cut out the ore in vaſt maſſes, and tumble it to the bottom with great noiſe. In ſuch ſituations they form caverns, and there appear ſafely lodged till the rope is lowered to convey them up again. Much of the ore is blaſted with gun-powder, eight tons of which are ſaid to be annually uſed for the purpoſe.

(7.) ANGLESEY, LEAD MINES AND OTHER MINERALS IN. "Nature hath been profuſe in beſtowing her mineral favours on this ſpot: for above the copper ore, and not more than three quarters of a yard beneath the common ſoil, is a bed of yellowiſh greaſy clay, from one to four yards thick, containing lead ore, and yielding from 600 to 1000 pounds weight of lead from one ton; and one ton of the metal yields not leſs than 57 ounces of ſilver. Mixed with the earth, are frequently certain parts of the colour of cinnabar. Whether theſe are ſymptomatic of the ſulphureous arſenical ſilver ores or of quickſilver, I will not pretend to decide. Something interferes with the ſucceſsful ſmelting of this earth in the grate; inſomuch that it has not yet been of that profit to the adventurers which might reaſonably be expected from the crucible aſſays of it, and they have at this time about 8000 tons on bank undiſpoſed of. This place has been worked for lead ore in very diſtant times. In the bottom of the pool was found an ancient ſmelting hearth of grit-ſtone, and ſeveral bits of ſmelted lead, of about four inches in length, two in breadth, and half an inch thick. Theſe works have added greatly to the population of the iſland; for about 1500 perſons are employed; who, with their families, are ſuppoſed to make near 8000 perſons, getting their bread from theſe mines. The little village of Almwich, the port of the place, is increaſing faſt, and the market grows conſiderable. At the ſeaſon of the greateſt work, Mr Hughe's men alone receive for many weeks L. 200. in one week, and L 150. in another, merely for ſubſiſtence. The port is no more than a great chaſm between two rocks, running far into land, and dry at low water; into which ſloops run, and lie ſecure to receive their lading."—Near Kmelyn Bay is a quarry of marble, common to this place, ſome parts of Italy, and to Corſica, and known in the ſhops by the name of *Verdi di Corſica*. Its colours are green, black, white, and dull purple, irregularly diſpoſed. In different blocks one or other of the colours are frequently wanting; but among the green parts are often found narrow veins of the moſt elegant and ſilky white aſbeſtos. It is a compound ſpecies of marble: part is calcareous and may acted on by aquafortis. The green parts partake of the nature of jaſper. It is apt to be interſected by ſmall cracks, or by aſbeſtine veins, therefore incapable of taking a high poliſh. This quarry lies on the lands of Monachty, in the pariſh of Llan-fair Ynghornwy; and it is found again in the iſle of Skerries, off this pariſh. Neither the quarry nor the aſbeſtos are at preſent in uſe. In Rhoſcolon pariſh, a green amianthus or brittle aſbeſtos, is met with in great plenty in a green marble ſimilar to the above; but by reaſon of the inflexible quality of its fibres not applicable to the ſame uſe. Beyond Caſtle-mawr, on the ſhore, are vaſt blocks of black-marble, filled with ſhells, corralloids and fungitæ.

(8.) ANGLESEY, POPULATION, &c. OF. The iſland is divided into 74 pariſhes, of which moſt of the churches are ſituated near the ſhores. By an account given on the 13th of Auguſt 1563 they were 2012 houſholds, or families, in Angleſey; allowing five to a family, the whole number of inhabitants in that period was 10,050. In 1776, the number of houſes in Angleſey was about 3,956: allowing five perſons to a family, the whole number of inhabitants was at that time 19,780; which wants only 340 of doubling the number of inhabitants in the intervening ſpace. The chief town is BEAUMARIS.

(9.) ANGLESEY, WOODS, &c. IN. Near the ferry of Moel y Don appear the fine woods of Sir Nicholas Bayley, ſkirting the Menai for a conſiderable way. The wooded part of the iſland is on this ſide. It commences at Llanidan, and recals the ancient Britiſh name of Angleſey, *Mon*, or the *Dark Iſland*, on account of the deep ſhape of its groves; but at preſent, except in this part, the iſland is entirely diveſted of trees and the climate ſo averſe to their growth, that in moſt parts it is with great difficulty the gentry can raiſe a plantation round their houſes. Plas Newydd, the ſeat of Sir Nicholas Bayley,

close upon the water, protected on three sides by venerable oaks and ashes. The view up and down this magnificent river-like strait is extremely fine. The shores are rocky; those on the opposite side covered with woods; and beyond a long range of Snowdonian alps. Here stood a house built by Gwenllian, a descendant of Cadrod Hardd. The mansion has been improved, and altered to a castellated form by the present owner. In these woods are some very remarkable druidical remains. Behind the house are to be seen two vast cromlechs. The upper stone of one is 12 feet 7 inches long, 12 broad, and four thick, supported by five tall stones. The other is but barely separated from the first: is almost a square, of five feet and a half, and supported by four stones. The number of supporters to cromlechs are merely accidental, and depend on the size or form of the incumbent stone. These are the most magnificent we have, and the highest from the ground; for a middle-sized horse may easily pass under the largest. In the lands of Penmaenmawr, indeed, there is a most stupendous one of a rhomboidal form. The greatest diagonal is 57 feet, the lesser 15, and the thickness 3 feet 6 inches; but its height from the ground is only 6 feet: it was supported by several stones. The Welsh, who ascribe every thing stupendous to their famous British king, call it *Arthur's Quoit*. The woods at this place are some druidical circles nearly continguous to each other.

ANGMERING, E. and W. two small villages in the county of Sussex, on the English Channel, near Arundel. They have a weekly market on Saturday, and a fair July 30.

ANGLI. See ANGLES, N° 1.

ANGLIA. See ENGLAND.

ANGLICANÆ GUTTÆ. See GUTTÆ.

ANGLICANUS SUDOR, the sweating sickness.

ANGLICISM. *n. f.* [from *Anglus*, Lat.] A mode of speech peculiar to the English language; an English idiom.—

They corrupt their style with untutored *Anglicism*. *Milton.*

ANGLICUS, Gilbertus, an eminent English physician, who flourished about the end of the 13th century. He wrote a Compendium of Physic.

ANGLIN, a river of France, in the department of Vienne.

ANGLING, among sportsmen, the art of fishing with a rod, to which are fitted a line, hook, and bait. See FISHING-ROD, FISHING-HOOK, FISHERY. The angler's first business is to attract fish to the place intended for angling. The method of doing this, in standing waters, by throwing in grains, chopped worms, and the like, is well known: but the chief difficulty is in running waters and brooks. The method, in this case, is to prepare a tin box capable of holding some hundreds of worms, bored on all sides, and full of holes of such a size as they may be just able to creep out at; there must be a plummet fastened to this box to sink it, and a line to draw it back at pleasure; in this case it is to be thrown into the water in a proper place, above which the angler may stand under cover. The worms will flow, and gradually crawl out of this box, and the fish will be gathered about to feed on them; the baited hook is to be thrown in higher up and carried down by the stream. If this method do not bring the fish about the place in a little time, there is reason to suspect that some pike lies lurking thereabout, and deters them: in this case, it is proper to throw out a baited hook, and he will generally be taken; after this the attempt will succeed. When the angler takes his stand, he is to shelter himself, under some trees or bush, or stand so far from the brink of the water, that he can only discern his float; as fish are timorous and easily frighted away. The angling rod must be kept in a moderate state, neither too dry nor too moist: in the first case, it will be brittle; in the other rotten. When pastes are used, it is proper to mix a little tow with them, and rub them over with honey; finally, a small anointing with butter is of great use to keep them from washing off the hook. The eyes of any fish that is taken are an excellent bait for almost any other kind of fish. The best way of angling with the fly is down the river and not up; neither need the angler ever make above half a dozen of trials in one place, either with fly or ground bait, when he angles for trout: by that time the fish will either offer to take, or refuse the bait and not stir at all. In a pond, the best place for the angler to take his stand is usually that where the cattle go up into water: in rivers, if breams are fished for, it should be in the deepest and most quiet places; if eels, under the banks of rivers, that hang over; perch are to be expected in clean places, where the stream is swift; the chub in deep shaded holes: roach are most found where the perch are, and trout only in swift and clear streams. Places where there are many weeds, or old stumps of trees, harbour fish in great numbers, and they usually bite freely there; but there is danger of entangling the line, or fastening the hook to the weeds. In case of this accident, recourse is to be had to a ring of lead, of about six inches round, fastened to a small pack-thread: this ring is to be thrust over the rod, and let fall into the water, at the place where the hook is entangled; and then, by pulling the pack-thread gently, the hook will be soon disengaged, or at the worst it can only be broke off near the end of the line; whereas, when this is not employed, the rod itself is sometimes broken, or the line nearer its upper end. Deep waters are best for angling in, for the fish do not love to be disturbed by wind and weather. The openings of sluices and mill-dams always bring fish up the current to seek for the food which is brought with the stream; and angling in these places is usually successful. The best season is from April to October; for, in very cold stormy weather, the fish will not bite: the best times of the day are from three till nine in the morning, and from three in the afternoon till sun-set. In an easterly wind, there is never much sport for the angler; the southerly winds are the best for his purpose, and a warm but lowering day is most of all to be chosen; a gentle wind, after a sudden shower, to disturb the water, makes a very good opportunity for the angler; the cooler the weather in the hottest months, the better, but in winter, on the contrary, the warmer the day the better. A cloudy day, after a bright moon-light night, is always a

good day for ſport; for the fiſh do not care for going after prey in the bright moon-ſhine, and are therefore hungry the next morning. Thoſe who are fond of angling might ſave themſelves ſome fruitleſs trouble, by obſerving when ſmall fiſh in a jar take or refuſe food. See FISH. The ſeveral methods of angling for ſalmon, trout, carp, tench, pearch, pike, dace, dudgeons, roach, flounder, &c. may be ſeen under the article FISHING.

ANGLO-CALVINISTS, a name given to the members of the church of England, becauſe their doctrinal articles are built on the ſyſtem of Calvin; though ſome modern writers alledge, that the doctrinal ſyſtem of the Engliſh church is Arminian. The Anglo-Calviniſts make one of the four branches or diviſions of Calviniſts; and ſtand diſtinguiſhed from the pure Calviniſts, the Piſcatorians, and the Arminians.

ANGLO-SAXON, an appellation given to the language ſpoken by Engliſh Saxons; in contradiſtinction from true Saxon, as well as modern Engliſh.

ANGLUS, Thomas, an Engliſh prieſt, well known for the ſingularity of his opinions, and ſeveral little tracts which he wrote in the 17th century. He went by ſeveral names. Mr Bailet ſays his true name was *White*; but that he uſed to diſguiſe it under that of *Candidus*, *Albus*, *Bianchi*, and *Richworth*. He was moſt known in France by the name of *Thomas Anglus*. Des Cartes generally called him Mr *Vitus*. He paſſed ſome time in moſt countries of Europe; but his longeſt ſtay was at Rome and Paris. When he was in England, he lived a conſiderable time in the family of Sir Kenelm Digby; for whoſe opinions he had a great eſteem, as may be ſeen in his preface to his Latin work concerning the Inſtitutions of the Peripatetic Philoſophy; for which he was a great advocate. He attempted even to make the principles of Ariſtotle ſubſervient to explain the moſt impenetrable myſteries of religion; ſuch as, predeſtination, free-will, grace, &c. Mr Baillet ſays, "What he wrote upon this ſubject reſembles the ancient oracles for obſcurity." In ſuch abſtruſe points, he was much embarraſſed; and, by giving too great ſcope to his own thoughts, he pleaſed neither the Moliniſts nor Janſeniſts. He is allowed, however, to have been a man of an extenſive and penetrating genius. On the 10th of June 1658, the congregation of the Index Expurgatorius at Rome condemned ſome of his treatiſes. The doctors of Douay cenſured alſo 22 propoſitions extracted from his Sacred Inſtitutions. He publiſhed his *Supplicatio poſtulativa juſtitiæ*, in oppoſition to their cenſure; wherein he complains that they had given him a vague undetermined cenſure, without taxing any particular propoſition. He died ſome time after the reſtoration of Charles II.

* ANGOBER. *n. ſ.* A kind of pear.

ANGOL, a pleaſant and well watered city of S. America, in the province of Chili, 125 miles N. of Baldivia. Lon. 78. 20. W. Lat. 38. 10. N.

(1.) ANGOLA, BOUNDARIES, CLIMATE, &c. OF. Angola is a kingdom on the weſtern coaſt of Africa, lying according to the moſt probable accounts, between Lat. 5. 0. and between 16. 21. S. forming a coaſt of upwards of 480 miles, Lon. 10° and 15° E. Angola Proper is bounded on the North by the river Danda, which ſeparates it from Congo; and on the South by the Coanza, by which it is ſeparated from Benguela. This laſt, however, is now included in the kingdom of Angola, having been conquered by its monarchs, though it ſtill retains the name of a kingdom, and is included in the dimenſions we have juſt now given. The air here is very hot and unwholeſome, and the country mountainous; there being but few plains to be met with in it, except on the ſea coaſt, and between the huge ridges of mountains.

(2.) ANGOLA, EARLIEST ACCOUNTS OF. That part of the kingdom which we have diſtinguiſhed by the name of *Angola Proper*, was ſubject to the kings of Congo in the year 1484, when the Portugueſe firſt diſcovered the country: but how long it had been ſo before that time, is not known; the inhabitants being utterly ignorant of chronology, and having no other way of diſtinguiſhing paſt events but by ſaying they happened in ſuch a king's reign. Neither, though Angola became a diſtinct kingdom ſince its diſcovery by the Portugueſe, is it known with more certainty at what time that revolution happened; or whether the Portugueſe were not concerned in aſſiſting the viceroy of the king of Congo, who governed the province of Angola, to ſet up for himſelf. All accounts agree, that this kingdom was founded by one *Ngola*, or *Angola*, from whom it took its name. According to the tradition of the country, this Ngola was a ſmith, and the inventor of that trade, in which he had been inſtructed by the demons of the country. In conſequence of this, he became exceeding rich, not in gold, ſilver or ſhell-money, which were not at that time in uſe; but in corn, cattle, and fruits, which were then exchanged in traffic. The country being not long after viſited by a grievous famine, Ngola generouſly relieved his diſtreſſed countrymen, and ſaved the lives of ſome thouſands. In gratitude of this generoſity, he was unanimouſly choſen king; and hence the ſmith's trade is reckoned among the royal arts of Angola.

(3.) ANGOLA, HISTORY OF. According to other accounts, which can be more depended upon, Ngola was the king of Congo's viceroy who, having become powerful by the reduction of ſeveral of the neighbouring ſtates, was induced to ſet up for himſelf. Dreading, nevertheleſs, the power of his old maſter, he choſe to ſend him the uſual tribute and preſents annually, till he reckoned himſelf firmly ſeated on the throne, and had ſecured it to his deſcendents. His meaſures were greatly facilitated by the wars which the king of Congo was then engaged in with the Gagas, a barbarous nation in the neighbourhood. Theſe made ſuch a powerful inroad into his dominions, that he was glad to aſk aſſiſtance from Ngola; not as a ſubject, but as a friend and ally. This was readily granted; and the two monarchs continued ever after, ſending preſents and aſſiſtance to each other, and encouraging a mutual commerce between their ſubjects. Ngola lived to a great age, highly reſpected by his ſubjects and in alliance with the king of Congo and the Portugueſe, whoſe numerous ſettlements on the coaſt, had made them become very powerful.

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According to the cuſtom of the country, he had many wives and concubines. By his chief favourite he had three daughters, Zunda Riangola, Tumba Riangola, and another, whoſe name is unknown. Towards the latter part of his life, the king's chief care was, to ſecure the crown to the eldeſt of theſe. By the queen's advice, he ſent for his lieutenant general, a favourite ſlave, whom he had created viceroy, to acquaint him with his reſolution. The artful miniſter applauded his deſign, though his intention was to defraud the princeſs, and ſeize the throne for himſelf. He accordingly took the opportunity, one day, when that princeſs, and the whole court, were employed in ſowing their lands, to ſpread a report, that the enemies of Angola had entered the kingdom, and were deſtroying every thing with fire and ſword. In this confuſion, the treacherous viceroy conducted the three princeſſes to the royal palace; and acquainting Ngola with the pretended danger, urged him to betake himſelf to a ſpeedy flight. The frighted monarch, unable to ſtir with age, deſired his miniſter to take the moſt proper means for his ſafety; whereupon, being a ſtout young fellow, he takes his majeſty on his back, and carries him into a neighbouring wood; where he no ſooner had him in a convenient place, than he ſtabbed him with a dagger.—This ſtratagem was too ſhallow to remain long concealed; the murderer was quickly diſcovered, and many of the nobles roſe in arms againſt him; but finding his party too ſtrong to be oppoſed, they were at laſt obliged to ſubmit, and ſuffer him quietly to aſcend the throne, upon his publickly declaring, that he had not ſeized it but with a view of ſecuring it to the princeſs Zunda Riangola. To this princeſs the uſurper palliated his conduct, in the beſt manner he could; and ſhe had art enough to diſguiſe her reſentment ſo effectually, that he never diſcovered the ſmalleſt occaſion for jealouſy. At laſt, his ſudden death gave Zunda an opportunity of aſcending the throne peaceably; when ſhe behaved with ſuch moderation and juſtice, as to gain the affection of all her ſubjects. Her jealous temper prevented her from marrying; and, by giving too much way to it, ſhe came at laſt to dread as rivals, the two ſons of her younger ſiſter Tumba, and to form deſigns againſt their life. To accompliſh her purpoſes, ſhe ordered them to be brought to court, pretending to have them educated under her own eye. This was declined for ſome time; but at length, the queen prevailed ſo far, as to have the eldeſt ſent to her; whom ſhe no ſooner got into her power, than ſhe cauſed him to be maſſacred, with all his attendants; only one eſcaping, covered with wounds, to carry the dreadful news to the princeſs, and her huſband. On hearing of this bloody act, the afflicted parents immediately ſallied forth, at the head of all their vaſſals. They were waited for, by queen Zunda, at the head of a numerous army; but, no ſooner did her ſoldiers perceive the parents of the deceaſed prince, than they immediately abandoned the queen to their reſentment.—Tumba immediately ruſhed upon her ſiſter, and ſtabbed her to the heart; after which, ſhe commanded her entrails to be taken out, and thrown into the hole in which her ſon's body had been caſt. Upon this, Tumba was crowned queen of Angola, and invited her huſband to participate with her in the management of public affairs.—This offer he was too wiſe to accept; and Tumba, upon his refuſal, reſigned the crown into the hands of her ſurviving ſon, Angola Chilivagni.—He proved a great and wiſe prince, extending his dominions by conqueſt, and gaining the love of his ſubjects, by the moderation and equity of his government. He was ſucceeded by one of his younger ſons, named Dambi Angola; who no ſooner aſcended the throne, than he put all his brethren to death, leſt they ſhould unite, in favour of the eldeſt. The reſt of his reign proved conformable to ſuch a beginning. He was a monſter of cruelty, avarice, lewdneſs, and perfidy. Death, however, in a ſhort time, happily delivered his ſubjects from this tyrant; who, not withſtanding his infamous life, was buried with the greateſt magnificence; and a mount was erected over his grave, conſiſting, according to the cuſtom of the country, of a prodigious number of human victims, which were ſacrificed to his ghoſt. Dambi Angola was ſucceeded by Ngola Chilivagni, a warlike and cruel prince. He conquered many nations, and made the moſt dreadful inroads into the kingdom of Congo, along the rivers of Danda, Lucalla, Zanda, and Coanza; whoſe waters were often tinged with the blood of thouſands, whom he maſſacred in his excurſions. Notwithſtanding theſe butcheries, Ngola Chilivagni ſhowed ſuch generoſity to thoſe who readily ſubmitted to him, that he was ſure to conquer, not only wherever he came, but wherever he ſeemed to direct his forces. At laſt, as if weary of conqueſt, he planted a tree on the banks of the Coanza, about eight leagues from Loanda, San Paulo, as a boundary to his ravages. This tree the Portugueſe called Iſanda, or Iſandaura; and afterwards erected a fortreſs near it. The ſame folly and inſolence, which took place in the breaſt of Alexander the great, on account of his rapid conqueſts, ſoon puffed up the mind of this petty African tyrant. Becauſe he had conquered and ravaged ſome of the neighbouring countries, and brought under his ſubjection a few cowardly barbarians; he firſt fancied himſelf invincible, and then that he was a god. He demanded the ſame reſpect and adoration that was paid to their other deities; and with this demand his ſubjects were ſervile enough to comply. This pretended deity, however, was forced to ſubmit to the fate of other mortals, and died without leaving a ſucceſſor behind him. On the deceaſe of Ngola Chilivagni, the ſtates elected Ngingha-Angolu-Chilombo-Kickaſanda, great nephew to queen Tumba's huſband, as his ſucceſſor. He proved ſuch a rapacious and cruel tyrant, that his ſubjects univerſally wiſhed for his death; which, luckily for them, ſoon happened. He was interred with the uſual pomp and ſolemnities, particularly that of having a whole hecatomb of human victims ſacrificed upon his grave. His ſon, Bandi Angola, who ſucceeded him, proved a greater tyrant than his father; ſo that he ſoon became intolerable to his ſubjects. A general revolt enſued, in which his ſubjects called in the cannibal

bal Giagas to their aſſiſtance. Theſe immediately poured in, like a band of hungry dogs, haſtening to feed upon a carcaſe; and having defeated and devoured the forces of the tyrant, beſieged him in an inacceſſible mountain, where they reſolved to reduce him by famine. Bandi Angola applied to the king of Congo for aſſiſtance. As it was the intereſt of that prince, to hinder the ravenous Giagas from entering into the Angolic dominions, whence they could eaſily paſs into his own, he ordered a ſtrong reinforcement of the Portugueſe, of whom he entertained a great number at his court, to march to the aſſiſtance of the king of Angola. The command of the army was given to one of the moſt experienced Portugueſe officers; who, depending more on the handful of Europeans he had under his command, than on the Congoneſe, attacked the rebels, though greatly ſuperior in number; and, having defeated them, reſtored the king of Angola to his throne. This eſſential ſervice ſo endeared the Portugueſe to Bandi Angola, that he took them into his ſervice, and even into his council. Their general became a great favourite of the king, but much more ſo of his daughter, who conceived a violent paſſion for him. Unfortunately for them both, the amour was carried on with ſo little precaution on her part, that the king quickly diſcovered it; and immediately formed a reſolution of exterminating the Portugueſe all at once. Such violent meaſures, however, could not be concerted ſo privately but the princeſs got intelligence of it; and having appriſed her lover, he immediately withdrew into Congo, taking with him as many of his countrymen as he could. The king of Congo expreſſed ſuch ſtrong reſentment againſt Bandi Angola for his ingratitude, that the Portugueſe general would have probably prevailed upon him to declare war againſt Angola, had he not been obliged to defend his own dominions againſt a neighbouring prince who then made an invaſion. This afforded that general a fair pretence of aſking leave to return home; promiſing to come with ſuch reinforcements, as would enable the king of Congo to revenge himſelf for the affront put upon him by the Angolic monarch. His real intention, however, was, to give the king of Portugal an opportunity of ſeizing upon the kingdom of Angola.—On his return to Liſbon, the Portugueſe general having laid his plan before the king, it was ſo well reliſhed, that an armament was ordered to be fitted out, well furniſhed with every neceſſary for building fortreſſes, &c. and a ſufficient number of men. The wind proving favourable all the way back, the Portugueſe ſoon arrived ſafe at Loando San Paulo; whence the general diſpatched a meſſenger to acquaint the king of Congo with his arrival, and to make him ſome rich preſents. Theſe were no ſooner gone than the admiral ſailed up the Coanza; and, landing without oppoſition in the kingdom of Angola, ſet about erecting a fortreſs in a convenient ſituation, which was completed in a few days.—The king being informed of the return of the Portugueſe, and of their fortifying themſelves on advantageous ground, gathered together a numerous army: but his forces, though upwards of 100,000 in number, were defeated by the Portugueſe; vaſt numbers killed, and many more carried into ſlavery. The admiral now ravaged the whole country with fire and ſword, and making himſelf maſter of every advantageous ſpot of ground. The king, however, had ſtill the good luck to eſcape all the ſtratagems that were laid for him; and once more got life to his inacceſſible fortreſs.—All this time Bandi Angola had tyrannized in ſuch a manner, that his ſubjects were become no leſs weary of his government than when they formerly revolted. Being now exaſperated beyond meaſure at the calamitous war of which he had been the occaſion, they formed a deſign of putting an end to his life; and in order to draw him out of his retreat, where he wallowed in all manner of debauchery, they had recourſe to the following ſtratagem: A deputation was ſent, acquainting him with the revolt of one Cuculo Cabazzo; who, at the head of a numerous band, committed the moſt cruel ravages. They beſought his majeſty either to levy a ſufficient number of troops, and march in perſon againſt him, or to allow them to arm themſelves againſt him. The credulous king complied with the laſt propoſal; and granted them leave to raiſe what forces might be thought neceſſary. Four days after, notice was ſent to the king, that his ſubjects had attacked the rebels, and had been repulſed with loſs; but that, if his majeſty would but condeſcend to animate them with his preſence, the ſight of him would inſpire them with ſuch courage, that they would aſſuredly prove victorious. This had the deſired effect; and the king ſet out a few days after, without any other precaution than his own guards, to head his army which was encamped on the banks of the Luculla. He no ſooner appeared in view, than all the chief officers came out to meet him; and having, under pretext of paying their reſpects, gradually ſeparated him from his guards, they fell upon him and diſpatched him at once. Bandi Angola was ſucceeded by his ſon Ngola Bandi, whoſe mother had been a ſlave; and whoſe title to the crown was conſequently diſputable, according to the laws of the country. Of this the new king being well appriſed, thought proper to begin his reign by murdering every perſon who oppoſed his election. He began with the *Tendula*, or commander of the king's rear-guard; who, by his office, is the chief of the electors, and the perſon who governs the kingdom during the interregnum. Him he ordered to be put to death, with all his family. Theſe were followed by the principal officers of his father's court; all his concubines, together with their parents and near relations, whom he cauſed to be butchered; together with his half brother, his father's ſon by a favourite concubine, and then but an infant. He did not ſpare even the ſon of his ſiſter Zingha Bandi, whom ſhe had by one of her paramours. The intereſt of his ſiſter had contributed greatly to raiſe this tyrant to the throne; and his ingratitude, with the murder of her ſon, ſo exaſperated her, that ſhe ſwore to be revenged on him in a ſimilar manner.—The Portugueſe were the next objects of his reſentment. Theſe he ſo much dreaded, that he reſolved not to lay down his arms till he had exterminated them, or driven them totally out of his dominions. His raſhneſs, however, coſt him dear. Thouſands of

of the Angolic troops were overthrown by an handful of Portugueſe; and the king himſelf was forced to fly, firſt into the iſland Chiconda in the river Coanza, and then into the deſarts of Oacco. Here his conquerors allowed him to live among the wild beaſts, without any other ſuſtenance than what the deſarts afforded. He had the misfortune alſo to loſe his queen and two ſiſters Cambi and Fungi, who were taken priſoners by the Portugueſe, but honourably treated.—The king being informed of this, ſent an embaſſy to treat of their ranſom and an exchange of priſoners. The propoſal was readily agreed to; and the princeſſes were ſent back, laden with preſents. The king, however, refuſed to perform his part of the agreement, and thereby plunged himſelf into ſtill greater difficulties. A new Portugueſe viceroy being arrived about this time, Ngola was quite at a loſs how to excuſe the non-performance of his part of the treaty. At laſt he had recourſe to his exaſperated ſiſter Zingha; and having excuſed, as well as he could, the murder of her ſon, propoſed to ſend her on a ſplendid embaſſy to the viceroy. Having conſented, but without forgetting her reſentment ſhe ſet out, as plenipotentiary for the king of Angola, with a magnificent retinue, was received with all the honour due to her rank, and lodged in a ſplendid palace.—At the firſt audience Zingha had of Don John, the Portugueſe viceroy, ſhe was ſurpriſed to find a ſtately elbow-chair prepared for him to ſit upon, and for herſelf only a rich tapeſtry ſpread on the floor, with a velvet cuſhion embroidered with gold, and placed over againſt the chair of ſtate. Diſſembling her diſpleaſure, however, ſhe beckoned to one of the ladies of her retinue, commanded her to lay herſelf down on her elbows and knees upon the carpet, and ſat herſelf upon her back during the whole time of the audience. She behaved with ſuch addreſs and dignity, as to gain the admiration of the whole council. A propoſal was made of entering into an alliance offenſive and defenſive with the king of Angola, provided he acknowledged himſelf the vaſſal of the king of Portugal, and ſubmitted to pay a yearly tribute. To this Zingha replied, that ſuch conditions were indeed fit to be impoſed upon thoſe who had been conquered by the ſword; but not upon a great and powerful monarch, who only ſought their friendſhip and alliance: upon which the treaty was concluded on both ſides, without any other conditions than the exchange of priſoners. The audience being over, Don John took notice to Zingha, as he conducted her out of the hall, that the lady who had ſerved her as a ſeat, continued ſtill in the ſame poſture; upon which ſhe replied, That it did not become the ambaſſadreſs of a great monarch to make uſe of the ſame chair twice, ſo ſhe looked upon her as a piece of *caſt-off goods*, not worthy of further notice! Zingha was ſo taken with the faſhions of the Portugueſe, and ſo intent upon obſerving the order, dreſs, arms, &c. of their troops, that ſhe ſtaid at Loanda a conſiderable time; during which ſhe was inſtructed in the Chriſtian religion, and conſented to be baptized. Don John and his ſpouſe were her ſponſors; who diſmiſſed her ſoon after, with all poſſible honours, and highly ſatisfied with her reception and ſucceſs. At her return, ſhe took care to have the articles ratified by her brother; who expreſſed his approbation of them, and the higheſt obligations to her. He even went ſo far as to deſire the viceroy to ſend him ſome proper perſons to inſtruct him in the Chriſtian religion, which he ſaid he was very deſirous of embracing. This requeſt was immediately granted; and Don Denis de Faria, a negro prieſt, a native of Angola, was diſpatched, along with an officer of diſtinction, to ſtand god-father to the king. Theſe met at firſt with a gracious reception: but when they came to talk of baptiſm, Ngola altered his tone, and told them it was too much below his dignity to receive it from the ſon of one of his ſlaves, and ſent them both back. This was cried up by the courtiers as a princely act: but Zingha repreſented that it could not fail to exaſperate the viceroy; and tried all poſſible means to diſſuade him from it, but in vain. He ſuffered, however, his other two ſiſters, Cambi, and Fungi, to be baptized; which was performed in 1625, with a ſplendor ſuited to their dignity. As no experience ſeems to have been a ſufficient antidote againſt the innate folly of Ngola Bandi, he ſoon after took it into his head to make war on the Portugueſe, and invade ſome of their territories. This laſt action proved his ruin: his troops were all cut off, and himſelf forced to ſwim for his life, to a ſmall iſland in the Coanza, about a mile long, and two bow-ſhots in breadth; whither the Portugueſe purſued and ſurrounded him, ſo that he had no other chance, but either to fall into their hands, or be devoured by the wild beaſts with which the place ſwarmed. From both theſe dangers he was relieved by a doſe of poiſon, given him, as was ſuppoſed, by his ſiſter Zingha. Before this time, however, he had taken care to ſend his eldeſt ſon to the country of the Giagas, and put him under the care of one of their chiefs called *Giaga Caza*, whom he beſought to take care of him and protect him from his aunt Zingha, as he rightly imagined ſhe would not fail to attempt his life, in order to ſecure herſelf on the throne. Zingha Bandi was crowned queen of Angola, without oppoſition, in 1627.—She was a very artful woman, endowed with great preſence of mind, firm in her reſolutions, of an intrepid courage, and a great miſtreſs in diſſimulation. She inherited a large ſhare of her brother's jealous and cruel temper, to which ſhe would not heſitate to ſacrifice her neareſt relations, if they gave her the leaſt umbrage. In ſhort Zingha appears to have been endued with all thoſe qualities, both good and bad, which, if not *neceſſary* to conſtitute, are, at leaſt generally found united in the character of what is commonly called a *great* monarch. And, therefore, as, in her virtues, as well as in her crimes, ſhe may vie with moſt of the great princes of Europe and Aſia, we ſhall allot to her a ſeparate article in our laſt Volume, to which we ſhall refer the reader for a particular account of her life and reign, under her name ZINGHA. With this view, we ſhall only add here in order to connect the hiſtory of Angola, that, after murdering her nephew with her own hand, ſhe ſtrengthened herſelf by alliances with the Giagas, the Congoeſe, and the Dutch,

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In order to drive the Portugueſe out of her kingdom; that, to ingratiate herſelf with the Giagas, ſhe renounced Chriſtianity and adopted their barbarous and bloody ſyſtem of idolatry: that, after waging a long and bloody war with the Portugueſe for a period of no leſs than 28 years, with various ſucceſs, the terror of her arms, notwithſtanding repeated defeats, became ſo great, that the Portugueſe were glad to propoſe terms of peace to her: that during theſe negociations ſhe ſhowed herſelf as great in the cabinet, as in the field, and acted with the ſpirit of an independent princeſs; and that, although ſhe voluntarily re-embraced Chriſtianity of her own accord, and even at a time when there was a conſiderable riſk of offending her Giagan troops and allies by doing it, yet ſhe did not allow the prieſts to interwarp her temporal with her ſpiritual concerns, but preſerved her independent ſpirit in her civil government, in ſpite of the influence of father Anthony himſelf. The terms of peace at laſt agreed upon between Zingha and the Portugueſe viceroy were. 1. "That the river Lucalla ſhould be the boundary between the dominions of the Portugueſe and of Queen Zingha. 2. That neither ſide ſhould thenceforth give any reception to the fugitive ſlaves of the other, but ſend them back without any delay, together with the priſoners which had been taken during the laſt war. 3. That the queen ſhould remain wholly free and exempt from all tribute and homage whatever, provided ſhe agreed to the other articles." Theſe terms were at laſt ſigned by the queen and viceroy in the month of April 1657, and ratified by the king of Portugal in the month of November that ſame year. After this, ſhe had a ſhort and ſucceſsful war with the Giagan chief, who diſliked her alliance with the Portugueſe, and whom ſhe defeated and killed. During the laſt 5 years of her reign ſhe endeavoured to propagate Chriſtianity among her ſubjects, and for that purpoſe ſent an embaſſy to the pope, to which ſhe received a very favourable anſwer. She died in 1662, aged 80, and was ſucceeded by her ſiſter Barbara. She was buried with extraordinary magnificence; and, out of regard to her, Barbara was twice inaugurated with the greateſt pomp, and the moſt joyful acclamations. Barbara was a very zealous Chriſtian, but wanted her ſiſter's abilities, and had the misfortune of being in the decline of life, lame, and almoſt blind. Beſides this, ſhe had been married to a proud ill-natured huſband, named Mona Zingha; who, though he owed her all his fortune and advancement, being himſelf no more than the ſon of a ſlave, uſed her with ſuch cruelty, even in the late queen's life, that ſhe was obliged to take refuge in the palace, from whence he had the inſolence immediately to fetch her. This ſo exaſperated queen Zingha, that ſhe had well nigh ordered him to be cut in pieces before her face; but pardoned him at the requeſt of father Antnony, who probably knew he was privy to ſome religious ſecrets which he might, in a caſe of ſuch emergency, have diſcloſed. On Barbara's acceſſion to the throne, however, he not only redoubled his cruelty to her, in hopes of getting the management of affairs entirely into his own hands, but invented accuſations againſt Anthony himſelf, with a deſign to extirpate both him and his religion. He gave out, that the late queen had been poiſoned by ſome favourite European diſhes, with which brother Ignatio uſed to regale her during her laſt illneſs; and attributed his wife's lameneſs and blindneſs to ſome ſorceries or charms uſed by the convent againſt her. He had even perſuaded, or rather forced, his queen to conſent that ſome of the ſinghillos or prieſts ſhould be brought to counter charm her diſtemper. Father Anthony, far from being intimidated at the accuſations brought againſt him, repaired immediately to the palace, where he boldly reprimanded the queen for giving ear to theſe jugglers, threatened at the ſame time to leave her dominions, and carry off with him all the croſſes, and other utenſils of religion, from which alone they could have any benefit. The queen returned a very ſubmiſſive anſwer; and promiſed to deliver up the counter charms which ſhe at that time had upon her, before ſunſet: which ſhe accordingly did, and ſent them to the convent by the hands of her ſecretary. This ſo exaſperated her huſband, and all the Giagan ſect, that they reſolved upon the deſtruction of all the prieſts and Europeans, and even the queen herſelf. This, however, was found improper to be attempted; and Mona Zingha was ſo much chagrined at his diſappointment, that he retired to his own eſtate; giving out, that he deſigned to meddle no more with ſtate affairs; but, in reality, to concert meaſures for engroſſing the ſovereignty to himſelf, and to deprive his wife of her life and crown. To accompliſh his purpoſe, he ſent a meſſenger to her, deſiring her to repair to his houſe, where he had ſomething of importance to communicate; but ſhe declining the invitation by the advice of father Anthony, he found himſelf diſappointed, and begged leave to retire to a province, under his own government. He was again diſappointed, and forbid to ſtir out of the province of Metamba. The queen was, however, guilty of an error not long after, in ſending Mona Zingha at the head of an army to quell a revolt on the frontiers. On his returning victorious, he thought himſelf ſtrong enough to revive the ancient Giagan rites, and therefore ordered 100 ſlaves to be ſacrificed to the manes of the deceaſed queen. Though the queen was immediately appriſed of his intention, and diſpatched a meſſenger expreſsly commanding him to deſiſt; yet Mona, by diſtributing ſome preſents, particularly ſome European wines, among the counſellors, effected his purpoſe with impunity. He did not forget to ſend ſome of the wine to father Anthony: but to prevent ſuſpicion preſented him only with a ſmall quantity, to be uſed, as he ſaid, at the maſs; adding, that if it proved agreeable, he would ſupply him with a larger quantity. The unſuſpecting prieſt drank about two glaſſes of it; and in about a quarter of an hour was ſeized with violent convulſions in the bowels, and other ſymptoms of being poiſoned. By proper aſſiſtance, however, he recovered; but he was ſo diſabled by this doſe, that he was obliged to abandon his miſſion. The queen's intimities in the mean time daily increaſing, Mona Zingha was delivered from all further oppoſition on her part, by her death, on the 24th of March

1666. Upon this, Mona Zingha made all poſſible haſte to get himſelf elected king; and immediately renounced the Chriſtian religion, raiſing a perſecution at the ſame time againſt its profeſſors. He even wrote to the Portugueſe viceroy, acquainting him with his having renounced Chriſtianity, which he had only embraced out of complaiſance to his queen, and with his deſign to revive the Giagan rites. To ſhow that he meant to be as good as his word, he ordered all the children under ſix years of age, that could be found, to be ſacrificed in honour of their infernal deities. He alſo recalled the ſinghillos, and heaped many favours upon them; ſo that they became entirely devoted to his purpoſes. He likewiſe cauſed many of his ſubjects to be privately poiſoned; and then gave out, that their unaccountable deaths were owing to their having abandoned the religion of their anceſtors, and embraced Chriſtianity; which he ſtiled the religion of a parcel of famiſhed ſtrangers, who through their extreme miſery, had been forced to leave their native country, and ſeek for a livelihood in the richeſt provinces of Africa. By ſuch ſtratagems he almoſt entirely extirpated Chriſtianity, and any appearances of civilization which had been introduced among his ſubjects. His career, however, was ſtopped by Don John the princeſs Barbara's firſt huſband, from whom ſhe had been divorced on account of his having another wife. He ſoon compelled the uſurper to fly into an iſland in the Coanza; but not having the precaution to reduce him entirely, Mona Zingha found means to retrieve his affairs, and at laſt defeated and killed Don John himſelf, by which he became maſter of the throne without any further oppoſition. He was no ſooner re-eſtabliſhed, than he began to purſue his butcheries with more fury than ever: when, on a ſudden, Don Franciſco, the ſon of Don John, appeared at the head of an army in oppoſition to the uſurper; and in the firſt engagement Mona Zingha being defeated and killed, Don Franciſco became the maſter of the empire. It is not known whether this prince kept to the terms of the alliance made by Queen Zingha with the Portugueſe or not.—Theſe, however, have preſerved their conqueſts, and for ſome time they allowed the natives to chooſe a king for themſelves, or rather they choſe him for them, as we have already noticed. Theſe kings enjoyed only a mere ſhadow of royalty; their whole grandeur conſiſting in being allowed to breed peacocks, and adorn themſelves with their feathers, which was forbidden to their ſubjects under pain of perpetual ſlavery.—The laſt of theſe kings was named Ngola Sedeſio, who, diſliking an empty name of royalty, revolted from the Portugueſe, and carried on a long war with them; but being at laſt defeated and killed, his head was cut off, ſalted, and ſent to Liſbon in pickle. After this the Portugueſe ſeem not to have thought it ſafe to truſt their Angolic ſubjects even with the name of a king of their own, but have veſted the power entirely in their viceroy; but as to the extent of his dominions, and how matters ſtand between him and that race of Angolic princes who have preſerved their liberty, we are entirely in the dark.

(4.) ANGOLA, INHABITANTS, PRODUCE AND TRADE OF. The Angolans are univerſally allowed to be tall, elegant, and handſome in their perſons, but the diſpoſition of their minds is variouſly repreſented by various authors. Thoſe who view them only in a ſtate of captivity, repreſent them as the moſt obſtinate, lazy and untractable, of all the ſlaves purchaſed on the coaſt of Africa. But thoſe, who have viewed them in a free ſtate on their native ſoil, ſpeak of them as an amiable, peaceable and hoſpitable people, who, from the fertility of their ſoil, and ſimplicity of their manners, live very much at their eaſe. It is doubtleſs owing to theſe circumſtances, that they diſplay ſuch a difference of character in theſe oppoſite ſituations; and that theſe injured people, when carried into captivity, ſhow an independency of ſpirit, and impatience of fatigue and control, much ſuperior to the natives of the Gold Coaſt; where the ſoil being barren, the inhabitants are more accuſtomed to labour and hardſhips. The manners, religion, dreſs, &c. of the Angolans, are much the ſame with thoſe of the Congoeſe. See CONGO. The ſoil produces Indian corn, beans, oranges, lemons, grain of various kinds, and great variety of fruits. Although the Portugueſe preſerve their ſuperiority in Angola, yet the Engliſh, Dutch, and other European nations, carry on trade with the natives for various commodities, but chiefly for ſlaves!

(5.) ANGOLA, PROVINCES, RIVERS, &c. OF. When in its greateſt ſplendor, the kingdom of Angola contained 17 provinces, viz. Cheſſama, Sumbi, Benguela, Rimba, Sicca, High and Low Bembea, Temba, Oacco, Cabezzo, Lubolo, Loanda, Bengo, Danda, Moſiche, Higher and Lower Ilamba, Oraij, and Embacca. The provinces conquered by the Portugueſe during the wars above mentioned, Danda, Moſiche, Bengo, the Higher and Lower Ilamba, Oraij, Embacca, Benguela, Sietta, Cabezzo, Lubolo, and Oacco. The principal rivers are thoſe already mentioned, viz. the DANDA and COANZA. The latter has two large iſlands in it, (beſides ſeveral ſmall ones,) called MASSANDER and MOTCHIAMIA, which, with the rivers, will be deſcribed in their order.

ANGOLA PEA, or PIGEON PEA. See CYTISUS.

ANGOLANS, the natives of ANGOLA. See § 4.

ANGOLIC, *adj.* of, or belonging to Angola.

ANGON, in the ancient military art, an engine of the bow kind. Others ſpeak of it as a kind of javelin uſed by the French, the iron head of which reſembled a *fleur de lys*. It is the opinion of ſome writers, that the arms of France are not *fleur de lys*, but the iron points of the angon, or javelin of the ancient French.

ANGONÆUS, in anatomy, a name given by Riolanus, and others, to a muſcle called by the generality of other writers *anconæus*, and *cubitalis minor*.

ANGONIA, } among ancient phyſicians, a
ANGOR, } concentration of the natural heat; the conſequence of which is a pain of the head, palpitation, and ſickneſs.

ANGORA, or } called alſo ANGOURA and
ANGORI, } ANGYRA. See ANGOURA.

ANGOT, a province or kingdom of Abyſſinia, formerly

formerly rich and fertile, but almoſt ruined by the Gallas, a wandering nation in the internal parts of Africa, who diſpoſſeſſed the Abyſſinian monarchs of all that was worth poſſeſſing.

ANGOULESME, a city of France, in the department of Charente, 20 miles W. of Limoges, 64 SE. of Rochelle, and 250 S. by W. of Paris. It is ſeated on the top of a hill, ſurrounded with rocks, at the foot of which runs the Charente. The inhabitants are about 8000, and drive a conſiderable trade in paper, which is their chief manufacture. Lon. 0. 14. E. Lat. 45. 39. N.

ANGOUMOIS, a ci-devant province of France, bounded on the N. by Poitou, on the E. by Limouſin and March, on the S. by Perigord, and on the W. by Saintonge. It is now included in the department of Charente. It is watered by the Touvre and Charente. The air is generally warmer than at Paris, though the country is hilly. The ſoil produces plenty of wheat, rye, oats, Spaniſh corn, ſaffron, grapes, and all ſorts of fruits. It has ſeveral iron mines, which yield a very good ſort of iron.

* ANGOUR. *n. ſ.* [*angor*, Lat.] Pain.—If the patient be ſurprized with a lipothymous *angour*, and great oppreſſion about the ſtomach, expect no relief from cordials. *Harvey.*

(1.) ANGOURA, or ANGYRA, anciently ANCYRA, a town of Natolia, in Aſiatic Turkey, remarkable for its remains of antiquity; ſuch as inſcriptions, pillars, ruins of temples, &c. It is at preſent one of the beſt cities in Anatolia; its ſtreets are full of pillars and buildings of old marble, among which are ſome of porphyry and jaſper. The greateſt part of the pillars are ſmooth and cylindrical; ſome are channelled ſpirally; but the moſt ſingular are oval, with plate bands before and behind from the top to the bottom of the pedeſtal. The caſtle, which is as large as a ſmall town, and well inhabited, both by Chriſtians and Turks, has a triple incloſure, and is built of white marble, and ſtone reſembling porphyry. Throughout the walls of the town, which are low, and thoſe of the houſes which are generally built of unburnt brick, but eſpeciallly thoſe of the towers, antique fragments of capitals, architraves, &c. are interſperſed. The baſha of Angoura has an income of about 30 purſes; and there are here about 300 janizaries, under the command of a Sardar. The number of inhabitants, as near as can now be computed, is about 50,000; of whom there are not leſs than 40,000 Turks; and the Arminians, Greeks, &c. compoſe the other 10,000. The Arminians have ſeven churches, beſides a monaſtery; and the Greeks two. The country produces very good red wine, and excellent rice grows on the banks of ſome of the rivers. In this place, there is the fineſt breed of goats in the world; their hair or wool is a pure dazzling white, about 9 inches long, and almoſt as fine as ſilk; a great trade is carried on in this article, and the fineſt ſtuffs, eſpecially camblets, are made of it. All the inhabitants are employed in this manufacture. The exports of Angoura, to Holland, France, and Great Britain, are about 1600 camels load yearly. Angoura is ſituated 212 miles SE. of Conſtantinople. Several large caravans paſs through this city to different places. Lon. 32. 5. E. Lat. 39. 30. N. See ANCYRA.

(1.) ANGOY, BOUNDARIES, EXTENT, TOWNS, &c. OF. A kingdom of Loango in Africa, bounded on the N. by Cacongo, and on the S. by Congo; from the former of which it is ſeparated by the Cabinda, and from the latter by the river Zaire. It is but of ſmall extent, being only a vaſſal province of Cacongo, till the mani or prince, who had married the daughter of a Portugueſe, was perſuaded by his father-in-law to make himſelf independent. This he effected at a favourable juncture, the king of Loango having but juſt before revolted from the king of Congo, and the king of Cacongo from the new king Loango. The country is full of woods and thickets; and has no towns of any note, except one called Bomangoy, ſituated on the north banks of the Zaire, and not far from its mouth. Its chief port is Cabinda, called alſo Kabenda, or Cubenda, ſituated on the mouth of a river of the ſame name about five leagues N. of Cape Palmerino, on the N. ſide of the Zaire's mouth. The bay is very commodious for trade, or wooding and watering along the ſhore. It is flat and marſhy in ſome places; but aſcends gradually about three miles inland, and then forms itſelf into a ridge of hills. On the aſcent of theſe is ſituated a town that belonged to the father-in-law of the king above-mentioned, where he conſtantly kept a ſtock of wood ready cut, to ſell to foreign ſhips at an eaſy rate. From theſe wood piles, SW. along the bay, lie ſcattered a number of fiſhermen's huts, on each ſide a ſmall freſh water river which falls into the bay; and thence all the water for ſhips is brought in caſks to the mouth of the river, which is ſo ſhallow, that even at full flood it can only be entered by yawls carrying a caſk or two. The town ſtands on the round point of the bay looking to the weſtward; and the Engliſh have a factory on the ſouth ſide of the road.

(2.) ANGOY, CUSTOMS, RELIGION, &c. OF THE NATIVES OF. The dreſs of the inhabitants is the ſame with that of the Congoeſe. They allow polygamy, and the beſt beloved wife hath the command of the reſt; but is no leſs liable to be turned out, if ſhe proves unfaithful. The ladies of the blood royal, however, have the privilege of chooſing their huſbands out of any, even the meaneſt rank; and have even the power of life and death over them; as over their paramours, if any of them are caught tripping: but the huſbands are by no means intitled to expect the ſame fidelity from their royal ladies. Women of the lower rank are obliged, when they receive a ſtranger, to admit them for a night or two to their embraces. This obliged the miſſionaries, who travelled through this country, to give notice of their approach to any of their houſes, that none of the female ſex might enter within their doors.—Their religion conſiſts chiefly in a variety of ſuperſtitious cuſtoms; ſuch as powdering their public and domeſtic idols with the duſt of a kind of red wood, on the firſt day of the moon, and paying a kind of worſhip to that planet. If, on that night, it happens to ſhine clear and bright, they cry out, "Thus may we

new

new my life as thou doſt;" but if the air is cloudy, they imagine the moon has loſt her virtue, and pay her no reſpect. We do not hear of their offering any ſacrifices to their idols; though they commonly conſult them about the ſucceſs of their enterpriſes, thefts, or the like. The king of Congo ſtill ſtyles himſelf ſovereign of Angoy; but the king of this little ſtate pays neither tribute nor homage to any foreign power.

(3.) ANGOY, PRODUCE, ANIMALS, &c. OF. The country round the bay is moſtly barren; owing chiefly to the lazineſs of the inhabitants, which often occaſions a ſcarcity of proviſions. The wild beaſts are ſo numerous in the woods, that they deſtroy all the tame kinds; there are therefore no cattle bred in it but hogs. From the woods in this country ſome monkeys have been brought, which in ſhape and ſtature reſembled the human ſpecies. Civet cats abound in great plenty, and parrots may be bought for three or four ordinary knives. The coaſts abound greatly with oyſters, which are found lying in heaps like ſmall rocks. The natives chiefly follow the occupation of fiſhing, on the ſea and in the rivers, making uſe of drag nets, which have long canes fixed at equal diſtances, inſtead of corks, to ſhow when any fiſh are caught. Theſe nets are made of a peculiar kind of root, which, after being beaten, may be ſpun like hemp.

(4.) ANGRA, a city of Tercera one of the Azores; the capital, not only of that iſland, but of all the reſt, and the reſidence of the governor. It is ſeated on the S. ſide, near the middle of the longeſt diameter of the iſland, on the edge of the ſea. The harbour is the only tolerable one in the whole iſland, being equally ſecured againſt ſtorms and the efforts of an enemy. It is of the form of a creſcent; the extremities of which are defended by two high rocks, that run ſo far into the ſea as to render the entrance narrow, and eaſily covered by the batteries on each ſide. From this harbour the town is ſaid to derive its name, the word *Angra* ſignifying a creek, bay, or ſtation for ſhipping; and this is the only convenient one among all the Azores. The opening of the port is from the E. to the SW. and, according to Frezier, it is not above four cables length in breadth, and not two of good bottom. Here ſhips may ride in great ſafety during the ſummer; but as ſoon as the winter begins, the ſtorms are ſo furious, that the only ſafety for ſhipping is the putting to ſea with all poſſible expedition. Happily, however, theſe ſtorms are preceded by infallible ſigns, with which experience has made the inhabitants perfectly well acquainted. On theſe occaſions the Pico, a high mountain in another of the Azores, is overcaſt with thick clouds, and grows exceedingly dark; but what they look upon as the moſt certain ſign is the fluttering and chirping of flocks of birds round the city for ſome days before the ſtorm begins. The town is well built and populous, is the ſee of a biſhop, under the juriſdiction of the archbiſhop of Liſbon. It hath five pariſhes, a cathedral, four monaſteries, as many nunneries, beſides an inquiſition and biſhop's court, which extends its juriſdiction over all the Azores, Flores, and Corvo. It is ſurrounded by a good wall, a dry ditch of great depth and breadth, and defended by a ſtrong caſtle rendered famous by the impriſonment of king Alphonſo VI. by his brother Peter II. in 1668. Though moſt of the public and private buildings have a good appearance externally, they are but indifferently furniſhed within; but for this poverty the Portugueſe excuſe themſelves, by ſaying, that too much furniture would prove inconvenient in ſo warm a climate. At Angra are kept the royal magazines for anchors, cables, ſails, and other ſtores for the royal navy, or occaſionally for merchantmen in great diſtreſs. All maritime affairs are under the inſpection of an officer called *Deſembergrador*, who hath ſubordinate officers and pilots for conducting ſhips into the harbour, or to proper watering places. The Engliſh, French, and Dutch, have each a conſul reſiding here, though the commerce of any of theſe nations with the Azores is very inconſiderable, being only for wood, corn and other proviſions. Lon. 27. 7. W. Lat. 38. 39. N.

(2.) ANGRA, a diſtrict of Tercera. See laſt article.

* ANGRILY. *adv.* [from *angry*.] In an angry manner; furiouſly; peeviſhly.—

I will ſit as quiet as a lamb;
I will not ſtir, nor wince, nor ſpeak a word,
Nor look upon the iron *angrily*. *Shakeſp.*

ANGRIVARII, a people of ancient Germany, who inhabited that part of the country, ſituated between the Weſer and the Ems, and eaſtward, reaching beyond the Weſer, as far as the Chæruſci, on which ſide they raiſed a rampart to the S. having the Tubantes on the Ems, and the Weſer, where it bends to the foreſt Bacenis; to the W. the Ems, and the confines of the Bructeri; and to the N. the territory between the Chamavi and Anſibarii. Ptolemy places them between the Chauchi, and Suevi or Catti. Their territory is ſuppoſed now to contain a part of the county of Schaumburg, the half of the biſhopric or principality of Minden; to the S. the greateſt part of the biſhopric of Oſnabrug, the N. part of the county of Teclenburg, and a part of the county of Ravenſberg. A trace of the name of the people ſtill remains in Engern, a ſmall town in the county of Ravenſberg.

(1.) ANGROGNA, } a mountainous but fer-
ANGROGNE, } tile diſtrict of Piedmont, acceſſible only at two places from the S. and E. and memorable for affording ſeveral ſafe retreats to thoſe zealous friends of religious truth and liberty, the Waldenſes and Albigenſes; who ſtood out againſt the power of papal tyranny, many centuries before the reformation. The caves under the rocks, afforded a ſafe aſylum, both to the people and their paſtors, who preached to them in theſe caverns, without interruption from their perſecutors.

(2.) ANGROGNE, or ANGROGNA, a ſmall river, which runs through the valleys of Piedmont, in the diſtrict of Angrogna.

(3.) ANGROGNE, or ANGROGNA, a town of Piedmont, ſituated in the diſtrict of Angrogna, 7 miles W. of Pignerol. Lon. 7. 15. E. Lat. 45. 0. N.

* ANGRY. *adj.* [from *anger*.] 2. Touched with anger; provoked.—Oh let not the Lord be

Ango, and I will ſpeak: peradventure there ſhall be thirty found there. *Gen.* xviii. 30. 2. It ſeems properly to require, when the object of anger is mentioned, the particle *at* before a thing, and *with* before a perſon; but this is not always obſerved.—Your Coriolanus is not much miſſed, but with his friends; the Commonwealth doth ſtand, and ſo would do, were he *angry at* it. *Shakeſpeare.*—Now therefore be not grieved, nor *angry with* yourſelves, that ye ſold me hither: for God did ſend me before you to preſerve life. *Gen.* xlv. 5.—I think it a vaſt pleaſure, that whenever two people of merit regard one another, ſo many ſcoundrels envy and are *angry at* them. *Swift.* 3. Having the appearance of anger; having the effect of anger.—The north wind driveth away rain; ſo doth an *angry* countenance a backbiting tongue. *Prov.* xxv. 23. 4. In chirurgery, painful; inflamed; ſmarting.—This ſerum, being accompanied by the thinner parts of the blood, grows red and *angry*; and, wanting its due progreſs into the maſs, firſt gathers into a hard ſwelling, and, in a few days, ripens into matter, and ſo diſcharged. *Wiſeman.*

ANGSANA, } in botany, names by which
ANGSAVA, } ſome authors have deſcribed the *draco arbor*, or *dragon's tree*; one of the trees ſaid to afford the *ſanguis draconis*, or dragon's blood of the ſhops. It is eſteemed an aſtringent, and an excellent remedy in the aphthæ.

ANGSO, a caſtle of Upland, in Sweden.

ANGTON, a town in Suſſex, near Arundel.

ANGUED. See ANGUID.

ANGUELLA, in ichthyology, a name given by ſome authors to the fiſh more uſually called heſpetus, and atherina, a ſmall fiſh caught about the ſhores of the Mediterranean, and ſome other places, and eſteemed a delicate taſted one.

ANGUELLES, in falconry, ſmall worms thrown up by hawks.

ANGUID, or ANGUED, a deſart of Tremecen, inhabited by hordes of wild Arabs, who live chiefly by plunder, and by forcing travellers to pay them a tax for what they call paſs-ports, which are a kind of ſmall flag at the end of a lance. As they raiſe little corn, dates, milk, wild fruits and game, are their principal fare. They ramble about the country, and pay no tribute to the Algerines, as they acknowledge no chief but their own.

ANGUITER, or ANGUITENENS, in aſtronomy, a cluſter of ſtars, reſembling a man holding a ſerpent.

ANGUIGENOUS, engendered of ſerpents.

ANGUILLA, the moſt northerly of the Carribbee iſlands, it has its name from its ſnake-like form; and is about ten leagues in length, and three in breadth. It was firſt diſcovered by the Engliſh in 1650, when it was filled with alligators and other noxious animals; but finding the ſoil fruitful, and proper for raiſing tobacco and corn, they ſettled a colony on it, and imported live cattle, which have ſince multiplied exceedingly. But the colony not being ſettled under any public encouragement, each planter laboured for himſelf, and the iſland became a prey to every rapacious invader, which diſheartened the inhabitants ſo much, that all induſtry was loſt among them. Their chief ſuffering was from a party of wild Iriſh, who landed here after the Revolution, and treated them worſe than any of the French pirates, who had attacked them before. The people of Barbadoes, and other Engliſh Carribbees, knowing the value of the ſoil, ſeveral of them removed to Anguilla, where they remained for many years, and even carried on a profitable trade, though without any government, either civil or eccleſiaſtical. In 1745, their militia, though not exceeding 100 men, defended a breaſt-work againſt 1000 French, who came to attack them; and at laſt obliged them to retire, with the loſs of 150 men, beſides carrying off ſome of their arms and colours, as trophies of their victory. Since that time, the inhabitants have ſubſiſted moſtly by farming; though they ſtill plant ſugar, and the iſland is ſaid to be capable of great improvements. It lies in the Atlantic Ocean, 100 miles N. of St Chriſtopher's. Lon. 63. 10. W. Lat. 18. 15. N.

ANGUILLABA, a ſmall town of Italy, in the patrimony of St Peter, 15 miles NW. of Rome.

ANGUILLARA, the name of, 1. a lake in Padua; 2. a ſmall town of Padua: and 3. a town of Italy, belonging to the Pope.

ANGUILLIFORMES, [from *anguilla*, an eel and *forma*, ſhape,] in ichthyology, a very large claſs of fiſhes, which are ſoft and lubricous like the eel, and have no ſcales. Moſt of the fiſh compriſed in this claſs, are long bodied alſo like the eel. Some of them have neither fins at the gills nor belly, as the *murui* and *lampetra*; others have fins at their gills, but none on their belly, as the ſea ſerpent, eel, conger, ophidion, and ammodytes. And others have both, as the tæniæ muſtelæ, alandæ, and the like. The word is alſo applied to ſome kinds of worms.

ANGUINA. See TRICOSANTHES.

ANGUINEAL HYPERBOLA. See HYPERBOLA and CURVE.

ANGUINEI VERSUS, in poetry, verſes, the words of which may be read backwards. They are alſo called recurrent verſes. Such, *e. g.* as

Optimum jus, lex amica, vox diſerta.
Diſerta vox, amica lex, jus optimum.

In others, ſuch as the following, the letters muſt be read backwards:

Otto tenet muppam, madidam mappam tenet Otto.

ANGUINUM OVUM, the *adder ſtone*, a fabulous kind of egg, ſaid to be produced by the ſaliva of a cluſter of ſerpents, and poſſeſſed of certain magical virtues. The ſuperſtition in reſpect to theſe, was very prevalent among the ancient Britons, and there ſtill remains a ſtrong tradition of it in Wales. Pliny gives a ſimilar account of it, lib. xix. cap. 3. This wondrous egg ſeems to have been nothing more than a bead of glaſs, uſed by the Druids, as a charm to impoſe on the vulgar; whom they taught to believe, that the poſſeſſor would be fortunate in all his attempts, and that it would gain him the favour of the great: ſo ancient and uniform has prieſtcraft been in all ages, religions, and nations. Our modern Druideſſes, ſays Mr Pennant, give much the ſame account of the ovum anguinum, (*glain neidr*, as the Welſh call it, or the adder-gem,) as the Re-

man philoſopher does; but ſeem not to have ſo exalted an opinion of its powers, uſing it only to aſſiſt children in cutting their teeth, or to cure the chincough, or to drive away an ague. Theſe beads are of a very rich blue colour; ſome plain, others ſtreaked. For their figure, ſee *Plate* XII. *fig.* 22. N° 1, 2, 3.

(I.) ANGUIS, or SNAKE, in zoology, a genus belonging to the order of amphibia ſerpentes.—The characters of the anguis are theſe: They are ſquamous or ſcaly in the belly, and under the tail; without any ſcuta. See *Plate* IX. *fig.* 3. There are 15 ſpecies, none of which, ſays Linnæus, are poiſonous.

1. ANGUIS BIPES, or two footed ſnake, is a native of the Indies; it has two ſhort feet, with two toes, near the anus. In every ſcale of this ſpecies, there is a brown point.

2. ANGUIS CERASTES, with 200 ſquamæ on the belly, and 15 on the tail, is a native of Egypt.

3. ANGUIS COLUBRINA, an inhabitant of Egypt, is beautifully variegated, with pale and yellow colours.

4. ANGUIS ERYX, a native of Britain, and likewiſe of America, is about a ſpan in length, and about the thickneſs of a man's finger. One from Aberdeenſhire, deſcribed by Mr Pennant, was 15 inches long; tongue broad and forked; noſtrils ſmall, round, and placed near the tip of the noſe; eyes lodged in oblong fiſſures, above the angle of the mouth; belly of a bluiſh lead colour, marked with ſmall white ſpots, irregularly diſperſed: The back of the body of a greyiſh brown, with three longitudinal duſky lines; one extending from the head, along the back, to the point of the tail; the others broader, and extending the whole length of the ſides. It was entirely covered with ſmall ſcales; largeſt on the upper part of the head.

5. ANGUIS FRAGILIS, or glaſs ſnake of Cateſby, has 129 ſquamæ on the belly, and 223 on the tail. The head is very ſmall, and the tongue of a ſimilar form. The upper part of the body is of a colour blended brown and green, moſt regularly and elegantly ſpotted with yellow, the uppermoſt part of which is brighteſt. The ſkin is very ſmooth: and ſhining with ſmall ſcales, more cloſely connected, and of a different ſtructure from thoſe of other ſerpents. A ſmall blow with a ſtick will cauſe the body to ſeparate, not only at the place ſtruck, but at two or three other places, the muſcles being articulated in a ſingular manner quite through to the vertebræ. They appear earlier in the ſpring than any other ſerpent, and are numerous in the ſandy woods of Virginia and Carolina. They are generally ſaid to be harmleſs.

6. ANGUIS JACULUS, or dart ſnake, is about three hand breadths long, and about the thickneſs of one's little finger. Its colour is a milky grey on the back, variegated with ſmall black ſpots, like ſo many eyes; and on the belly it is perfectly white. The neck is wholly black; and from that, two milk white ſtreaks run all the way along the back to the tail: the black ſpots alſo are each ſurrounded with a ſmall circle of white. It has its name from its vibrating its body in the manner of a dart. It is a native of Egypt, Libya, and the iſlands of the Mediterranean.

7. ANGUIS LATICAUDA, a native of Surinam; the tail is compreſſed, acute, pale, with brownish belts.

8. ANGUIS LUMBRICALIS, a native of America, has 230 ſquamæ on the belly and 7 on the tail; its colour is a yellowiſh white.

9. ANGUIS MACULATA, a native of America, is yellow, and interſperſed with aſh-coloured lines on the back; the head is ſmall in proportion to the body.

10. ANGUIS MELEAGRIS, is a native of the Indies; it has ſmall teeth, but no ears. This ſpecies has a great reſemblance to the former.

11. ANGUIS PLATURA: The head is oblong and without teeth; the body is about a foot and a half long, black above and white below; the tail is about one-ninth of the length of the animal, much compreſſed or flatted, and variegated with black and white; the ſcales are roundiſh, ſmall, not imbricated, but they cannot be numbered.

12. ANGUIS QUADRUPEDES, or four footed ſnake. The body of this ſpecies is cylindrical, with 14 or 15 longitudinal aſh-coloured ſtreaks; the teeth are extremely ſmall; it has no ears: the feet are at a great diſtance from each other, very ſhort, with five toes and ſmall nails; but the toes are ſo minute, that they can hardly be numbered: It is a native of Java.

13. ANGUIS RETICULATA, a native of America, has brownish ſcales, with a white margin.

14. ANGUIS SCYTALE, a native of the Indies, with 220 ſquamæ on the belly, and 13 on the tail. The head is ſmall and oval, and the eyes are little; the body is cylindrical, about a foot and a half long, covered with oval obtuſe ſcales: the tail is thick and obtuſe like the head; its colour is white, interſperſed with browniſh rings; the margins of the ſcales are of an iron colour; and the top of the head is blue.

15. ANGUIS VENTRALIS, blind worm, or ſlow worm, grows to about a foot in length, and to the thickneſs of a man's little finger: the irides are red: the head is ſmall; the neck ſtill more ſlender; from that part the body grows ſuddenly, and continues of an equal bulk to the tail, which ends quite blunt. The colour of the back is cinerous, marked with very ſmall lines, compoſed of minute black ſpecks: the ſides are of a reddiſh caſt: the belly duſky: both marked like the back. The tongue is broad and forky; the teeth are minute, but numerous; the ſcales ſmall. The motion of this ſerpent is ſlow, from which, and from the ſmallneſs of the eyes, are derived its Engliſh names. It reſembles the viper in the manner of producing its young, which are put forth alive. It is frequent with us in gardens and paſtures, where it lives principally under ground, feeding on worms. Like others of the genus, they lie torpid during winter, and are ſometimes found in vaſt quantities twiſted together.

(II.) ANGUIS ÆSCULAPII. See COLUBER.

* ANGUISH. *n. ſ.* [*angoiſſe*, Fr. *angor*, Lat.] Exceſſive pain either of mind or body; applied to the mind, it means the pain of *ſorrow*, and is ſeldom uſed to ſignify other paſſions.—They had proſecutors, whoſe invention was as great as their cruelty.

cruelty. Wit and malice conſpired to find out ſuch deaths, and thoſe of ſuch incredible *anguiſh*, that only the manner of dying was the puniſhment, death itſelf the deliverance. *South.*

* ANGUISHED. *adj.* [from *anguiſh.*] Seized with anguiſh; tortured; exceſſively pained; not now in uſe.—

Feel no touch
Of conſcience, but of fame, and be
Anguiſh'd, not that 'twas ſin, but that 'twas ſhe.
Donne.

ANGUISHOUS, full of anguiſh. *Chaue.*

ANGUITENENS. See ANGUIFER.

ANGUIUM LAPIS, a name given to a ſuppoſed ſtone in Germany, which is of a cylindric figure, and has a cavity capable of admitting a finger, and of a yellow colour, with a great many variegations. The vulgar call it *duchaneek*, and have an idle opinion of its originating from a ſerpent ant. De Boot, who had ſeen many of them, declares them to be fictitious, and made of glaſs tinged with different colours. See ANGUINUM OVUM.

* ANGULAR. *adj.* [from *angle.*] 1. Having angles or corners; cornered.—As for the figure of cryſtal, it is for the moſt part hexagonal, or ſix cornered, being built upon a confuſed matter, from whence, as it were from a root, *angular* figures ariſe, even as in the amethyſt and baſaltes. *Brown's Vulgar Errs.* 2. Conſiſting of an angle.—The diſtance of the edges of the knives from one another, at the diſtance of four inches from the *angular* point, where the edges of the knives meet, was the eight part of an inch. *Newton's Opticks.*

(1.) ANGULAR MOTION is a compound kind of motion, wherein the moveable both ſlides and revolves at the ſame time; ſuch as the motion of the wheel of a coach, or other vehicle.

(2.) ANGULAR MOTION, in aſtronomy, is the increaſe of the diſtance between any two planets, revolving round any body as the common centre of their motion. The quantity of this motion is expreſſed by two right lines, drawn from the centre to the revolving bodies; which will open wider, and conſequently the angle will grow greater, as the revolving bodies part farther from one another.

ANGULARIS SCAPULÆ, in anatomy, a name given by Winſlow, and others, to the muſcle of the ſhoulder generally called the *levator ſcapulæ.*

* ANGULARITY. *n. ſ.* [from *angular.*] The quality of being angular, or having corners.

* ANGULARLY. *adv.* [from *angular.*] With angles or corners.—Another part of the ſame ſolution afforded us an ice *angularly* figured. *Boyle.*

* ANGULARNESS. *n. ſ.* [from *angular.*] The quality of being angular.

* ANGULATED. *adj.* [from *angle*] Formed with angles or corners.—Topazes, amethyſts, or emeralds, which grow in the fiſſures, are ordinarily cryſtallized, or ſhot into *angulated* figures; whereas, in the ſtrata, they are found in rude lumps, like yellow, purple, and green pebbles. *Woodward.*

* ANGULOSITY. *n. ſ.* [from *angulous.*] Angularity; cornered form. *Diſt.*

* ANGULOUS. *adj.* [from *angle.*] Hooked; angular.—Nor can it be a difference, that the parts of ſolid bodies are held together by hooks, and *angulous* involutions; ſince the coherence of the parts of theſe will be of as difficult a conception. *Glanville.*

ANGURIA, the WATER-MELON: A genus of the diandria order, belonging to the monœcia claſs of plants; and in the natural method ranking under the 35th order, Cucurbitaceæ. The eſſential characters are theſe: The male calyx is quinquefid, and the corolla quinquepetalous: The female calyx and corolla the ſame: The pericarpium is a pome beneath, with two cells: The ſeeds are numerous. Of this genus, Linnæus reckons three ſpecies, viz.

1. ANGURIA PEDATA;
2. ANGURIA TRIFOLIATA; and
3. ANGURIA TRILOBATA.

} Of theſe only one ſpecies is known in this country, by the name of *Citrul.* The fruit is cultivated in Spain, Portugal, Italy, and other warm countries of Europe; as alſo in Africa, Aſia, and America; where it is eſteemed on account of its wholeſome cooling quality; but in Britain it is held in little eſtimation. To have this fruit good, ſome ſeeds muſt be procured of three or four years old; new ſeeds being apt to produce vigorous plants, which are ſeldom ſo fruitful as thoſe of a moderate ſtrength. Theſe are to be ſown in the hot-bed for early cucumbers. Some new dung is to be prepared in the beginning of February, which ſhould be thrown into a heap to heat, as is practiſed for early cucumbers. The bed is then to be made in the ſame manner as for the muſk-melon, covering the dung about five inches thick with loamy earth: but as theſe plants require much more room than either cucumbers or common melons, there ſhould be but one plant put into a three-light frame. A hill of the ſame loamy earth ſhould therefore be raiſed a foot and a half high, in the middle light of each frame; into which, when the bed is of a proper temper for heat, the plants ſhould be carefully planted, obſerving to water and ſhade them until they have taken good root. As to other particulars, their management differs very little from that of the muſk-melon: only they muſt frequently have freſh air admitted to them; and, when the nights are cold, the glaſſes muſt be covered with mats to keep the beds warm.

ANGUS, a county of Scotland, famous in ancient times for having given a title to the brave Douglaſſes Earls of Angus. It is frequently called Forfarſhire, eſpecially in the Acts of the Britiſh Parliament, from Forfar, the chief town of the county. It is bounded on the N. by Aberdeenſhire; on the NE. by the Mearns, or Kincardineſhire; on the E. by the German ocean; on the S. by the Frith of Tay; and on the W. by Perthſhire. Its length and breadth are nearly equal, being about 35 miles. It has many lakes and hills; with quarries of free-ſtone and ſlate, and mines of lead and iron ore. The principal rivers are the N. and S. Eſk. The lower grounds are fertile in corn and paſture, and along the coaſt, the ſalmon fiſhing is extenſively carried on. For farther particulars, ſee FORFAR, § 1.

ANGUSIAN, or ÆNEANUS, according to Buchanan, the 37th king of Scots, ſucceeded his couſin

cousin Romach, A. D. 351, and soon after obtained a victory over Nectan king of the Picts; whom he chased into Camelon his chief city. But in a subsequent battle, which proved still more obstinate, both kings and many of their nobles were slain, A. D. 154.

* ANGUST. *adj.* [*angustus*, Lat.] Narrow; strait.

* ANGUSTATION. *n. f.* [from *angustus*.] The act of making narrow; straitening; the state of being narrowed.—The cause may be referred either to the grumousness of the blood, or to obstruction of the vein somewhere in its passage, by some *angustation* upon it by part of the tumour. *Wiseman.*

ANGUSTICLAVIA, [from *angustus*, narrow, or small, and *clavus*, a stud,] in Roman antiquity, a tunica embroidered with little purple studs. It was worn by the Roman knights, as the laticlavia was by the senators.

ANGARA. See ANGOURA.

ANHALEIN, or } an epithet given to various
ANHALDINA, } medicines, formerly kept as secrets in the family of Anhalt. Three of the most celebrated medicines under this denomination are a corrosive, a water and a spirit. The corrosive, as described by Burgrave is a compound of calcined antimony, sublimate mercury, sal ammoniac, and calcined tartar, distilled and rectified. The description of the *Anhalt* water is given in the common dispensatories, and that of the spirit may be found in De Spina.

(I.) ANHALT, an island of Denmark, in North Jutland, lying in the Categate, 8 miles from the coast of Jutland, 10 from Zetland, and 7 from Hyland. It is dangerous for seamen, for which reason there is a light house erected on it.

(II.) ANHALT, a principality of Germany, in the circle of upper Saxony. It is a long narrow tract, situated for the most part betwixt the rivers Elbe and Saal, about 90 miles in length from E. to W. but of unequal breadth, the greatest being on the E. side, which is 35 miles, and other parts not exceeding 8. It is bounded on the S. by the Halberstadt, on the E. by the duchy of Saxony, and on the N. by the duchy of Magdeburg. It abounds in corn, and is watered by the Salde and Mulda; its principal trade is in beer.—The house of Anhalt, from whence the electors of Saxony and Brandenburg are said to derive their original, is a very ancient family. The best genealogists deduce their origin from Berenthobaldus, who made war upon the Thuringians in the 6th century; It has produced many princes who make a great figure in the German history. Joachim Ernest, who died in 1586, left five sons who divided the principality among them, and thus gave rise to five branches of the family of Anhalt, viz.

1. ANHALT-BERNBURG,
2. ANHALT-COETHEN,
3. ANHALT-DESSAU,
4. ANHALT-SCHAUMBURG,
5. ANHALT-ZERBST.

All these princes having children, and being of equal authority, they unanimously agreed to submit to the eldest of the family, who has the supreme government, which is *Anhalt-Dessau*. The Saxons acknowledge that the inhabitants of these little independent sovereignties live in great affluence. These petty princes possess lands sufficient for their expences, the revenues being reckoned about half a million of dollars. The tax on lands is 4 *per cent* which rating them at 20 years purchase, is not quite one shilling in the pound. Upon an emergency, the subjects are able to raise half a million extraordinary. The towns in these little states are not so numerous in proportion to the extent of country as in Saxony, but better peopled.

(III.) ANHALT WATER. See ANHALDIN.

ANHALTINA. See ANHALDINE.

ANHELATIO, or ANHELITUS, among physicians, a shortness of breath.

* ANHELATION. *n. f.* [*anhelo*, Lat.] The act of panting; the state of being out of breath.

* ANHELOSE. *adj.* [*anhelus*, Lat.] Out of breath; panting; labouring of being out of breath. *Dict.*

ANHELOTE. See ANHLOTE.

ANHELUS. See ANHELATIO.

ANHIMA, in ornithology, a brasilian bird, somewhat resembling the crane. It is distinguished in a very singular manner from all other birds, having a long single horn on its head, inserted a little above the origin of the beak, and standing forwards, and a little bent downwards. This is of two or three fingers breadth long, and is slender and round, as if nicely turned, and is of a bony substance, and fine white colour; and on the front of each wing it has two other such horns growing from the substance of the bone. It is found about waters, and is a very voracious bird, but feeds only on vegetables. It is longer than a swan; and is of a mixed colour of black, grey and white, with a very little yellow in some places. They are always seen male and female together; and the male is twice as large as the female, which is here described, and is larger than our swan. It makes a very loud noise, often repeating the notes, *uyhu, uyhu.*

ANHINGA, in ornithology, a very elegant Brasilian water fowl, about the size of our common duck. Its beak is straight, very sharp, not thick, and about three fingers breadth long, and has all along the middle, as well above as below, long series of hooked prickles all bending backwards; its head is small, and its neck slender and long, not less than a foot in length; its legs are short, and its toes connected by a membrane, as in the cormorant and duck kind; its tail is ten fingers breadth long; its wings, when folded, reach not more than half the length of the tail; its head and neck are yellowish, and covered with extremely soft velvet-like feathers; its breast, belly, and thighs, are of a silvery white; the upper part of its back is brown spotted with yellow, and the rest all black; it is common on the Brasilian shores, and feeds on fish.

ANHLOTE, in law, a single tribute or tax. The words *anhlote*, and *anscot*, are mentioned in the laws of William the Conqueror; and their sense is, that every one should pay, according to the custom of the country, his part and share, as scot and lot, &c.

ANHOLT, or ANHALT. See ANHALT.

ANHUBA, in botany, a name by which some authors call the sassafras tree, the wood of which is much used in medicine.

ANHYDROS, in botany, a name given by the ancient Greeks, and from them copied by the Romans in the time of Pliny, to expreſs one of thoſe kinds of the *ſtrychna*, or night-ſhades, which, when taken internally, cauſed madneſs.

ANI, in ornithology, the name of a Braſilian bird, ſomewhat allied to the parroquet kind. It is about the ſize of a thruſh, and is all over black. It is very common in the woods, but is not eaten.

(1.) ANIAN, a barren ſandy deſart, lying on the eaſt coaſt of Africa. It is ſo exceſſively hot, and otherwiſe inhoſpitable, that it contains but very few inhabitants, except ſome wandering Arabs, who live in camps.

(2.) ANIAN, the name of a ſtrait formerly ſuppoſed to lie between the north eaſt of Aſia, and the north weſt of America; but now found to exiſt only in imagination.

ANIANE, a town of France, in the department of Herault, at the foot of the mountains, near the river Arre. Lon. 3. 40. E. Lat. 43. 45. N.

ANICETTS, Pope, ſucceeded Pius I. about the year 157. He filled the ſee of Rome 11 years.

ANICH, Peter, an ingenious mathematician, was born at Oberperzuf, near Inſpruck, in 1723. His father being a poor labourer, he was indebted to Father Hill, a Jeſuit in the univerſity of Inſpruck, for his education. This gentleman diſcovering the genius of young Anich, took him under his own tuition and patronage; and he quickly became an able aſtronomer, and an ingenious mechanic. He made an elegant pair of globes for the univerſity of Inſpruck, and conſtructed different mathematical inſtruments. He alſo drew maps and charts with the greateſt accuracy and neatneſs. He died in 1766, and the empreſs queen, as a teſtimony of regard to his merit, ſettled a penſion of fifty florins a year on his ſiſter.

ANICHINI, Lewis, a native of Ferrara, in Italy, who made a medal for pope Paul III. on which was repreſented the interview between Alexander the Great and the High Prieſt at Jeruſalem. So exquiſite was the engraving of this medal, that Michael Angelo, on viewing it, burſt out in rapture, that the art was now arrived at the height of perfection.

ANICIUS, the ſurname of a patrician family in ancient Rome, ſeveral of whom were conſuls and honoured with triumphs; and one of whom was the firſt Roman ſenator who embraced the Chriſtian faith.

ANIELLO, or MASSANIELLO. See NAPLES, HISTORY OF.

ANJENGO, a ſmall town and factory, with a fort, on the coaſt of Malabar, in the peninſula on this ſide the Ganges, belonging to the Eaſt India Company. The fort is ſmall, but neat and ſtrong; it is a ſquare with four baſtions, having eight guns mounted on each, carrying a ball of 18 pounds. Two of theſe baſtions face the ſea, the other two the country. Beſides theſe, there is a line of 18 or 20 guns pointing towards the ſea, of 18 and 24 pounders. About a piſtol ſhot from the back of the fort, runs a river, which, beſides being a ſecurity to the factory, adds much to the agreeable ſituation of the place. This river has its ſource in ſome diſtant mountains; and deſcending, in a courſe from the north and eaſt, it afterwards turns, in ſeveral pleaſing meander ſo far to the weſt, as to waſh the bottom of ou factory's garden, and at laſt winding to the ſouth it empties itſelf into the ſea. Several beautifu ſmall iſlands too, which are waſhed by its cur rent, diverſify the ſcenery, and greatly height the beauty of the proſpect. This ſettlement ſup plies our Eaſt India Company with pepper, cal coes; and its ſituation is alſo very convenient for giving proper intelligence to our ſhips touch ing here from Europe, or from any part of Indi Lon. 75. 1. E. Lat. 7. 0. N.

* ANIENTED. *adj.* [*aneantir*, Fr.] Fruſtra ted; brought to nothing.

* ANIGHTS. *adv.* [*a* for *at*, and *night*.] I the night time.—Sir Toby, you muſt come in ea lier *anights*; my lady take great exceptions a your ill hours. *Shakeſpeare.*

* ANIL. *n. ſ.* The ſhrub from whoſe leave and ſtalks indigo is prepared.

ANIL, or NIL, in botany, a ſynonime of ſpecies of indigofera. See INDIGOFERA.

* ANILENESS. } *n. ſ.* [*anilitas*, Lat.] The ſtat
* ANILITY. } of being an old woman the old age of women.

(1.) ANIMA among divines and naturaliſts, d notes the ſoul, or principal of life, in animal See SOUL.

(2.) ANIMA, in chemiſtry, the volatile princ ple in bodies, whereby they are capable of b ing raiſed by the fire: Thus *anima jaſpidis*, th ſoul of Jaſper, &c.

(2.) ANIMA, in muſic, ſignifies with life an ſpirit, and expreſſes a degree, of movement ſimil to *Vivace*, being a medium between *Allegro* an *Largo*.

(4.) ANIMA, in pharmacy, is applied to ſimpl medicines, exalted by ſolution and extraction t a high degree of power. In this ſenſe, we me with *anima aloes*, *anima rhabarbari*, *anima ver ris*, &c.

ANIMA ARTICULORUM, a denomination ſome times given to hermodactyls; on account of the efficacy in diſorders of the joints.

ANIMA HEPATIS, ſoul of the liver; a term ap plied by the chemiſts to the ſal martis, ſalt of iro or ſteel; on account of its uſe in diſtempers o that part. It is more uſually ſtiled *vitriolum mar tis*.

ANIMA MUNDI, [*i. e.* the Soul of the World] a certain pure ethereal ſubſtance or ſpirit, diffuſe according to many of the ancient philoſopher through the maſs of the world, informing, actu ating, and uniting the divers parts thereof int one great, perfect, organical, and vital body o animal. Plato treats at large of the ψυχη του κο μου, in his *Timæus*; and even is ſuppoſed to be th author of the *dogma*; yet interpreters are muc at a loſs about his meaning. Ariſtotle, however taking it in the common and obvious ſenſe, ſtre nuouſly oppoſes it. The modern Platoniſts ex plain their maſter's *anima mundi* by a certain uni verſal ethereal ſpirit, which in the heavens exiſt perfectly pure, as retaining its proper nature; bu on earth pervading elementary bodies, and inti mately mixing with all the minute atoms thereof it aſſumes ſomewhat of their nature, and become of a peculiar kind. They add, that this *anima mundi*

mundi, which more immediately reſides in the celeſtial regions as its proper ſeat, moves and governs the heavens in ſuch a manner, as that the heavens themſelves firſt received their exiſtence from the fecundity of the ſame ſpirit: for that this *anima* being the primary ſource of life, every where breathed a ſpirit like itſelf, by virtue whereof various kinds of things were framed conformable to the divine ideas.

ANIMA PULMONUM, crocus, or ſaffron, ſo called on account of its ſuppoſed effect in diſeaſes of the lungs.

ANIMA SATURNI, a white powder obtained by pouring diſtilled vinegar on litharge, of conſiderable uſe in enamelling. See ENAMEL.

* ANIMABLE. *adj.* [from *animate*.] That which may be put into life, or receive animation. *Dict.*

(1.) * ANIMADVERSION. *n. ſ.* [*animadverſio*, Lat.] 1. Reproof; ſevere cenſure; blame.—He diſmiſſed their commiſſioners with ſevere and ſharp *animadverſions*. *Clarendon*. 2. Puniſhment. When the object of animadverſion is mentioned, it has the particle *on* or *upon* before it.—When a bill is debating in Parliament, it is uſual to have the controverſy handled by pamphlets on both ſides; without the leaſt *animadverſion upon* the authours. *Swift*. 3. In law.—An eccleſiaſtical cenſure, and an eccleſiaſtical *animadverſion*, are different things; for a cenſure has a relation to a ſpiritual puniſhment, but an *animadverſion* has only a reſpect to a temporal one; as, degradation, and the delivering the perſon over to the ſecular court. *Ayliffe's Parergon*. 4. Perception; power of notice: not in uſe.—The ſoul is the ſole percipient which has *animadverſion* and ſenſe properly ſo called. *Glanville*.

(2.) ANIMADVERSION, in literature, is uſed to ſignify, ſometimes correction, ſometimes remarks upon a book, &c. and ſometimes a ſerious conſideration upon any point.

* ANIMADVERSIVE. *adj.* [from *animadvert*.] That has the power of perceiving, percipient: not in uſe.—The repreſentation of objects to the ſoul, the only *animadverſive* principle, is conveyed by motions made on the immediate organs of ſenſe. *Glanville*.

* ANIMADVERSIVENESS. *n. ſ.* [from *animadverſive*.] The power of animadverting, or making judgment. *Dict.*

* *To* ANIMADVERT. *v. n.* [*animadverto*, Lat.] 1. To paſs cenſures upon.—I ſhould not *animadvert on* him, who was a painful obſerver of the decorum of the ſtage, if he had not uſed extreme ſeverity in his judgment of the incomparable Shakeſpeare. *Dryden*. 2. To inflict puniſhments. In both ſenſes with the particle *upon*.—If the Authour of the univerſe *animadverts upon* men here below, how much more will it become him to do it upon their entrance into a higher ſtate of being? *Grew*.

* ANIMADVERTER. *n. ſ.* [from *animadvert*.] He that paſſes cenſures, or inflicts puniſhments.—God is a ſtrict obſerver of, and a ſevere *animadverter upon*, ſuch as preſume to partake of thoſe myſteries, without ſuch a preparation. *South*.

(1.) * ANIMAL. *adj.* [*animalis*, Lat.] 1. That which belongs or relates to animals.—There are things in the world of ſpirits, wherein our ideas are very dark and confuſed; ſuch as their union with *animal* nature, the way of their acting on material beings, and their converſe with each other. *Watt's Logic*. 2. *Animal* functions, diſtinguiſhed from *natural* and *vital*, are the lower powers of the mind, as, the will, memory, and imagination. 3. *Animal* life is oppoſed, on one ſide, to *intellectual*, and, on the other, to *vegetable*. 4. *Animal* is uſed in oppoſition to *ſpiritual* or *rational*; as, the *animal* nature.

(2.) * ANIMAL. *n. ſ.* [*animal*, Lat.] 1. A living creature corporeal, diſtinct, on the one ſide, from pure ſpirit; on the other, from mere matter.—*Animals* are ſuch beings, which, beſides the power of growing, and producing their like, as plants and vegetables have, are endowed alſo with ſenſation and ſpontaneous motion. Mr *Ray* gives two ſchemes of tables of them.

* ANIMALS are either

- Sanguinous, that is, ſuch as have blood, which breathe, either by Lungs, having either
  - Two Ventricles in their heart, and thoſe either
    - Viviparous, as Quadrupeds.
    - Aquatic, as the whale kind.
  - Or But one Ventricle in their heart, as frogs, tortoiſes, and ſerpents.
    - Oviparous, as Birds.
- Or Gills, as all ſanguineous fiſhes, except the whale kind.
- Exſanguinous, that is, without blood; which may be divided into
  - Greater, and thoſe either
    - Naked, as the poulp, cuttle fiſh, &c.
    - Or covered with a tegument.
      - Cruſtaceous, as lobſters and crab fiſh.
      - Or Teſtaceous, either
        - Univalve, as limpets.
        - Bivalve, as oyſters, muſcles, cockles.
        - Or Turbinate, as periwinkles, ſnails, &c.
  - Terreſtrial, as naked ſnails.
  - Leſſer, as inſects of all ſorts, either Vivipa-

Viviparous hairy *Animals*, or quadrupeds, are either

- Hoofed, which are either
  - Whole-footed, or hoofed, as the horſe and aſs;
  - Or Cloven-footed, having the hoof divided into either
    - Two principal parts, called biſulca, either
      - Such as chew not the cud, as ſwine;
      - Or Ruminant, *i. e.* ſuch as chew the cud; divided into
        - Such as have perpetual and hollow horns; as the Beef kind, Sheep kind, & Goat kind.
        - And Such as have ſolid, branched & deciduous horns, as the deer kind.
    - Or Four parts, or Quadriſulca, as the hippopotamus.
- Or Clawed or digitate, having the foot divided into either
  - Two parts or toes, having two nails, as the camel kind;
  - Or Many toes or claws; either
    - Undivided, as the elephant,
    - Or Divided; which have either
      - Broad nails, and an human ſhape, as apes;
      - Or Narrower, and more pointed nails.

In reſpect of their teeth, they are divided into

- Such as have many fore teeth, or cutters in each jaw, viz.
  - The greater, which have either
    - A ſhorter ſnout & rounder head, as the cat kind;
    - Or A longer ſnout, as the dog kind.
  - and The leſſer, the vermin or weaſel kind.
- And Such as have Only two large and remarkable fore teeth, all which are phytivorous, and are called the hare kind.

* Vegetables are proper enough to repair *animals*, as being near of the ſame ſpecific gravity with the animal juices, and as conſiſting of the ſame parts with animal ſubſtances, ſpirit, water, ſalt, oil, earth; all which are contained in the ſap they derive from the earth. *Arbuthnot on aliments.*— Some of the animated ſubſtances have various organical or inſtrumental parts, fitted for a variety of motions from place to place, and a ſpring of life within themſelves, as beaſts, birds, fiſhes, and inſects; theſe are called *animals*. Other animated ſubſtances are called vegetables, which have within themſelves the principles of another ſort of life and growth, and of various productions of leaves and fruit, ſuch as we ſee in plants, herbs, and trees. *Watt's Logic.* 2. By way of contempt, we ſay of a ſtupid man, that he is a *ſtupid animal*.

(37) ANIMAL, CHARACTERISTIC MARK OF AN. To the above definitions of an animal, we would add, as a ſtill more accurate and diſtinctive characteriſtic, that an animal is an organiſed living body, endued with ſenſation; for minerals are ſaid to grow or increaſe, plants to grow and live, but animals alone have ſenſation. It is this property alone that can be deemed the eſſential characteriſtic of an animal; and by which the animal and vegetable kingdoms ſeem to be ſo eſſentially ſeparated, that we cannot even imagine the leaſt approximation of the one to the other. Thoſe naturaliſts, indeed, who have ſuppoſed the diſtinction between animals and vegetables to conſiſt in any thing elſe, have found themſelves greatly embarraſſed; and have generally agreed, that it was extremely difficult, if not impoſſible, to ſettle the boundaries between the animal and vegetable kingdoms. But this difficulty will be eaſily ſeen to ariſe from their taking the characteriſtic marks of the animal kingdom, from ſomething that was evidently common to both. Thus Boerhaave attempted to diſtinguiſh an animal from a vegetable by the former having a mouth, which the latter has not: but here, as the mouth of an animal is only the inſtrument by which nouriſhment is conveyed to its body, it is evident that this can be no eſſential diſtinction, becauſe vegetables alſo require nouriſhment, and have inſtruments proper for conveying it into their bodies; and where the end is the ſame, a difference in the means can never be eſſential. The fixing the difference in the animal's having a gula, ſtomach, and inteſtines, as is done by Dr Tyſon, is as little to the purpoſe.

(4.) ANIMAL LIFE AND MOTION, APPEARANCES OF, IN PLANTS. No power, at firſt view, ſeems more diſtinctive between an animal and a vegetable than that of moving from one place to another. Many have thought this power ſufficient to conſtitute a difference, and indeed, in moſt caſes,

caſes, it is the obvious mark by which we diſtinguiſh them. But Lord Kames hath given ſeveral very curious inſtances of the locomotive power of plants; ſome of which, as he ſays, would do honour to an animal.—"Upon the ſlighteſt touch, the ſenſitive plant ſhrinks back and folds up its leaves, ſimilar to a ſnail; which on the ſlighteſt touch retires with in its ſhell. A new ſpecies of the ſenſitive plant hath been lately diſcovered." (See DIONÆA.) "If a fly perch upon one of its flower-leaves, it cloſes inſtantly, and cruſhes the inſect to death. There is not an article in botany more admirable than a contrivance, viſible in many plants, to take advantage of good weather, and to protect themſelves againſt bad. They open and cloſe their flowers and leaves in different circumſtances: ſome cloſe before ſunſet, ſome after: ſome open to receive rain, ſome cloſe to avoid it. The petals of many flowers expand in the ſun: but contract at night, or on the approach of rain. After the ſeeds are fecundated, the petals no longer contract. All the trefoils may ſerve as a barometer to the huſbandman; they always contract their leaves on an impending ſtorm. Some plants follow the ſun, others turn from it. Many plants, on the ſun's receſs, vary the poſition of their leaves, which is ſtyled the *ſleep of plants*. A ſingular plant was lately diſcovered in Bengal. Its leaves are in continual motion all day long; but when night approaches, they fall down from an erect poſture to reſt." (See HEDYSARUM.) "A plant has a power of directing its roots for procuring food. The red whortle-berry, a low evergreen plant, grows naturally on the tops of our higheſt hills, among ſtones and gravel. This ſhrub was planted in an edging to a rich border, under a fruit wall. In two or three years, it over-ran the adjoining deep laid gravel walk; and ſeemed to fly from the border, in which not a ſingle runner appeared. An effort to come at food in a bad ſituation, is extremely remarkable in the following inſtance. Among the ruins of Newabby, formerly a monaſtery in Galloway, there grows on the top of a wall a plane tree about 20 feet high. Straitened for nouriſhment in that barren ſituation, it ſeveral years ago directed roots down the ſide of the wall, till they reached the ground ten feet below; and now the nouriſhment it afforded to thoſe roots during the time of their deſcending is amply repaid, having every year ſince that time made vigorous ſhoots. From the top of the wall to the ſurface of the earth, theſe roots have not thrown out a ſingle fibre; but are now united in a ſingle root. Plants, when forced from their natural poſition, are endued with a power to reſtore themſelves. A hop-plant, twiſting round a ſtick, directs its courſe from S. to W. as the ſun does. Untwiſt it, and tie it in the oppoſite direction: it dies. Leave it looſe in the wrong direction: it recovers its natural direction in a ſingle night. Twiſt a branch of a tree ſo as to invert its leaves, and fix it in that poſition: if left in any degree looſe, it untwiſts itſelf gradually, till the leaves be reſtored to their natural poſition. What better can an animal do for its welfare? A root of a tree meeting with a ditch in its progreſs, is laid open to the air. What follows? It alters its courſe like a rational being, dips into the ground, ſurrounds the ditch, riſes on the oppoſite ſide to its wonted diſtance from the ſurface, and then proceeds in its original direction. Lay a wet ſponge near a root laid open to the air; the root will direct its courſe to the ſponge. Change the place of the ſponge; the root varies its direction. Thruſt a pole into the ground at a moderate diſtance from a ſcandent plant: the plant directs its courſe to the pole, lays hold of it, and riſes on it to its natural height. A honeyſuckle proceeds in its courſe, till it be too long for ſupporting its weight; and then ſtrengthens itſelf by ſhooting into a ſpiral. If it meet with another plant of the ſame kind, they coaleſce for mutual ſupport; the one ſcrewing to the right, the other to the left. If a honeyſuckle twig meets with a dead branch, it ſcrews from the right to the left. The claſpers of briony ſhoot into a ſpiral, and lay hold of whatever comes in their way for ſupport. If, after completing a ſpiral of three rounds, they meet with nothing, they train again by altering their courſe."

(5.) ANIMAL LIFE AND MOTION COMPARED WITH THOSE OF PLANTS. By comparing the above and other inſtances of ſeeming voluntary motion in plants, with that ſhare of life wherewith ſome of the inferior kinds of animals are endued, we can ſcarce heſitate at aſcribing the ſuperiority to the former; that is, putting ſenſation out of the queſtion. Muſcles, for inſtance, are fixed to one place as much as plants are; nor have they any power of motion, beſides that of opening and ſhutting their ſhells: and in this reſpect they have no ſuperiority over the motion of the ſenſitive plant; nor doth their action diſcover more ſagacity, or even ſo much, as the root of the plane tree mentioned by Lord Kames. The Count de Buffon, who ſeems to be deſirous of confounding the animal and vegetable kingdoms, denies ſenſation to be any eſſential diſtinction. "Senſation (ſays he) more eſſentially diſtinguiſhes animals from vegetables: but ſenſation is a complex idea, and requires ſome explication. For if ſenſation implied no more than motion conſequent upon a ſtroke or an impulſe, the ſenſitive plant enjoys this power. But if, by ſenſation, we mean the faculty of perceiving and comparing ideas, it is uncertain whether brute animals are endowed with it. If it ſhould be allowed to dogs, elephants, &c. whoſe actions ſeem to proceed from motives ſimilar to thoſe by which men are actuated, it muſt be denied to many ſpecies of animals, particularly to thoſe which appear not to poſſeſs the faculty of progreſſive motion. If the ſenſation of an oyſter, for example, differed only in degree from that of a dog; why do we not aſcribe the ſame ſenſation to vegetables, though in a degree ſtill inferior? This diſtinction, therefore, between the animal and vegetable, is neither ſufficiently general nor determined. From this inveſtigation we are led to conclude, that there is no abſolute and eſſential diſtinction between the animal and vegetable kingdoms; but that nature proceeds, by impreceptible degrees, from the moſt perfect to the moſt imperfect animal, and from that to the vegetables; and the freſh water polypus may be regarded as the laſt of animals and the firſt of plants." It were to be wiſhed, that philoſophers

would on ſome occaſions conſider, that a ſubject may be dark as well on account of their inability to ſee, as when it really affords no light. The Count boldly concludes, that there is no eſſential difference between a plant and an animal, becauſe we aſcribe ſenſation to an oyſter, and none to the ſenſitive plant; but we ought to remember, that though we cannot perceive a diſtinction, it may nevertheleſs exiſt. Before Buffon, therefore, had concluded in this manner, he ought to have proved that ſome vegetables were endowed with ſenſation. It is no doubt, however, as much incumbent on thoſe who take the contrary ſide of the queſtion, to prove that vegetables are not endowed with ſenſation, as it was incumbent on Mr Buffon to have proved that they are. But a little attention will ſhow us, that the difficulty here proceeds entirely from our inability to ſee the principle of ſenſation. We perceive this principle in ourſelves, but no man can perceive it in another. Why then does every individual of mankind conclude that his neighbour has the ſame ſenſations with himſelf? It can only be from analogy. Every man perceives his neighbour formed in a manner ſimilar to himſelf; he acts in a ſimilar manner on ſimilar occaſions, &c. Juſt ſo it is with brute animals. It is no more doubtful that they have ſenſations, than that we have them ourſelves. If a man is wounded with a knife, for inſtance, he expreſſes a ſenſe of pain and endeavours to avoid a repetition of the injury. Wound a dog in the ſame manner, he will alſo expreſs a ſenſe of pain; and, if you offer to ſtrike him again, will endeavour to eſcape, before he feels the ſtroke. To conclude here, that the action of the dog proceeded from a principle different from that of the man would be abſurd and unphiloſophical to the laſt degree. We muſt further take notice, that there are ſenſations eſſentially diſtinct from one another; and in proportion as an animal is endowed with more or fewer of theſe different ſpecies, it is more or leſs perfect as an animal: but, as long as one of them remains, it makes not the leaſt approach to the vegetable kingdom; and, when they are all taken away, is ſo far from becoming a vegetable, that it is only a maſs of dead matter. The ſenſes of a perfect animal, for inſtance, are five in number. Take away one of them, ſuppoſe ſight; he becomes then a leſs perfect animal, but is as unlike a vegetable as before. Suppoſe him next deprived of hearing: his reſemblance to a vegetable would be as little as before; becauſe a vegetable can neither feel, taſte, nor ſmell, and we ſuppoſe him ſtill to enjoy theſe three ſenſes. Let us, laſtly, ſuppoſe him endowed only with the ſenſe of feeling, which, however, ſeems to include that of taſte, and he is no more a vegetable than formerly, but only an imperfect animal. If this ſenſe is then taken away we connect him not with the vegetable kingdom, but with what Buffon calls *brute matter*. It is to this kingdom, and not to the vegetable, that animals plainly approximate as they deſcend. Indeed, to ſuppoſe an approximation between the vegetable and animal kingdoms, is very abſurd: for, at that rate, the moſt imperfect animal ought to be the moſt perfect plant: but we obſerve no ſuch thing. All animals, from the higheſt to the loweſt, are poſſeſſed of vegetable life; and that, as far as we can perceive, in an equal degree, whether the animal life is perfect or imperfect: nor doth there ſeem to be the ſmalleſt connection between the higheſt degree of vegetation and the loweſt degree of ſenſation. Though all animals, therefore, are poſſeſſed of vegetable life, theſe two ſeem to be as perfectly diſtinct and incommenſurate to one another, as any two things we can poſſibly imagine.

(6.) ANIMAL SENSATION, NOT DISCOVERABLE IN PLANTS. The power of vegetation, is as perfect in an onion or leek, as in a dog, an elephant, or a man: and yet, though you threaten a leek or an onion ever ſo much, it pays no regard to your words, as a dog would do; nor, though you wound it, does it avoid a ſecond ſtroke. It is this principle of ſelf-preſervation in all animals, which, being the moſt powerful one in their nature, is generally taken, and with very good reaſon, as the true characteriſtic of animal life. This principle is undoubtedly a conſequence of ſenſation; and as it is never obſerved to take place in vegetables, we have a right to ſay that the foundation of it, namely ſenſation, belongs not to them. There is no animal, which makes any motion in conſequence of external impulſe when danger is threatened, but what puts itſelf in a poſture of defence; but no vegetable whatever does ſo. A muſcle, when it is touched, immediately ſhuts its ſhell; and as this action puts it in a ſtate of defence, we conclude that it proceeded from the principle of ſelf-preſervation. When the ſenſitive plant contracts from a touch, it is no more in a ſtate of defence than before; for whatever would have deſtroyed it in its expanded ſtate, will alſo do it in its contracted ſtate. We conclude, therefore, that the motion of the ſenſitive plant proceeds only from a certain property called by phyſicians *irritability*; and which though our bodies poſſeſs it in an eminent degree, is a characteriſtic neither of animal nor vegetable life, but belongs to us in common with brute matter. It is certain that an electrified ſilk thread ſhows a much greater variety of motions than any ſenſitive plant. If a bit of ſilk thread is dropt on an electrified metal plate, it immediately erects itſelf: ſpreads out the ſmall fibres like arms; and, if not detained, will fly off. If a finger is brought near it, the thread ſeems greedily to catch at it. If a candle approaches, it claps cloſe to the plate, as if afraid of it.—Why do we not conclude that the thread in this caſe is really afraid of the candle? For this plain reaſon, That its ſeeming flight is not to get away from the candle, but to get towards the electrified metal, and, if allowed to remain there, it will ſuffer itſelf to be burnt without offering to ſtir.—The ſenſative plant, in like manner, after it has contracted, will ſuffer itſelf to be cut in pieces, without making the leaſt effort to eſcape. The caſe is not ſo with the meaneſt animal. An hedge hog, when alarmed, draws its body together, and expands its prickles, thereby putting itſelf in a poſture of defence. Throw it into water; and the ſame principle of ſelf-preſervation prompts it to expand its body and ſwim. A ſnail when touched, withdraws itſelf into its ſhell; but if a little quicklime is ſprinkled upon it

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ſo that its ſhell is no longer a place of ſafety, it is thrown into agonies, and endeavours to avail itſelf of its locomotive power in order to eſcape the danger. In muſcles and oyſters, indeed, we cannot obſerve this principle of ſelf-preſervation ſo ſtrongly, as nature has deprived them of the power of progreſſive motion: but, as we obſerve them conſtantly to uſe the means which nature has given them for ſelf-preſervation, we can have no reaſon to think that they are deſtitute of that principle upon which it is founded.

(7.) ANIMALS ENDUED WITH VEGETABLE LIFE. After all that has been ſaid on this ſubject, there is no need of arguments drawn from the inferior creation. We ourſelves are poſſeſſed both of the animal and vegetable life, and certainly ſhould know whether there is any connection between vegetation and ſenſation or not.—We are conſcious that we exiſt; that we hear, ſee, &c.: but of our vegetation we are abſolutely inconſcious. We feel a pleaſure, for inſtance, in gratifying the calls of hunger and thirſt; but of the proceſs by which our aliment is formed into chyle, the chyle mixed with the blood, the circulation of that fluid, and the ſeparation of all the humours from it, we are altogether ignorant. If we then, who are more perfect than other vegetables, are utterly inſenſible of our own vegetable life, why ſhould we imagine that the leſs perfect vegetables are ſenſible of it? To illuſtrate our reaſoning here by an example:—The direction of the roots of the plane tree mentioned by Lord Kames, ſhows as much ſagacity, if we are to look only to the outward action, as can be obſerved in any motion of the moſt perfect animal whatever; nevertheleſs, we have not the leaſt ſuſpicion, either that the tree ſaw the ground at a diſtance, or that it was informed of its being there by the reſt of its roots. If a wound is made in the body of a man, and a loſs of ſubſtance is to be repaired, the ſame ſagacity will be obſerved in the arrangement of the fibres, not only as if they were animated, but they will diſpoſe of themſelves ſeemingly with a degree of wiſdom far ſuperior to what we have any idea of; yet this is done without our having the leaſt knowledge either how it is done, or of its being done at all. We have therefore in ourſelves a demonſtration, that vegetable life acts without knowing what it does: and if vegetables are ignorant of their moſt ſagacious actions, why ſhould we ſuſpect that they have a ſenſation, let it be ever ſo obſcure, of any of their inferior ones, ſuch as contracting from a touch, turning towards the ſun, or advancing to meet a pole? Thus we may eaſily give the Count de Buffon a reaſon why we aſcribe ſenſation to an oyſter, and none to a vegetable; namely, becauſe we perceive the vegetable do nothing but what is alſo performed in our own bodies, without our having the leaſt ſenſation of it; whereas an oyſter puts itſelf in a defenſive poſture on the approach of danger; and this being an action ſimilar to our own upon a like occaſion, we conclude that it proceeds from the ſame principle of ſenſation. Here it may alſo be obſerved, that though the inferior animals are deficient in the number, they are by no means ſo in the acuteneſs of their ſenſations; on the contrary, though a muſcle or an oyſter is probably endowed with no other ſenſe than that of feeling, yet this ſenſe is ſo exquiſite, that it will contract upon the ſlighteſt touch, ſuch as we would be altogether inſenſible of. As to that power of contractility, or irritability, which is obſerved in ſome plants; our ſolids have it, when deprived both of vegetable and animal life: for a muſcle, cut out of a living body, will continue to contract, if it is irritated by pricking it, after it has neither ſenſation nor vegetation. To theſe arguments againſt the probability of plants having any degree of ſenſation, or animal life, ſome have added others, drawn from the miſerable ſtate that plants would be in, if they had any; and the incompatibility of ſuch a ſuppoſition with infinite goodneſs, &c. But as we apprehend this argument, if it proved any thing, would prove too much, by militating equally againſt the introduction of pain or phyſical evil in any form, we will not enter upon it—more eſpecially as we think the above abundantly deciſive of the queſtion.

(8.) ANIMALS, THE CLASSIFICATION OF. We have already given Mr Ray's claſſification, (§ 2.) as quoted by Dr Johnſon; but the celebrated Linnæus has made out a more beautiful and complete claſſification by diſtributing animals into ſix claſſes, viz. *mammalia*, *aves*, *amphibia*, *piſces*, *inſecta*, *vermes*. Each claſs is divided into a certain number of orders, and each order is again ſubdivided into *genera*, or kinds, each of which contains a variety of ſpecies. The ſyſtem of this ingenious naturaliſt includes 354 kinds, and near 6000 known ſpecies. See his Syſtema Naturæ. For other particulars relating to different animals, their analogous ſtructure, ſagacity, inſtinct, peculiarities, &c. See AMPHIBIOUS, COMPARATIVE ANATOMY, ENTOMOLOGY, ICHTHYOLOGY, INSTINCT, MIGRATION, ORNITHOLOGY, OVIPAROUS, QUADRUPED, SINGING, VIVIPAROUS, ZOOLOGY, &c.

(1.) ANIMAL FLOWER, in zoology, a name given to ſeveral ſpecies of animals belonging to the genus of ACTINIA of Linnæus. They have likewiſe been diſtinguiſhed by the names of *Urtica Marina*, or *Sea-nettle*, from their ſuppoſed property of ſtinging; and *Sea-anemone*, from their claws or tentacles being diſpoſed in regular circles, and tinged with a variety of bright lively colours, reſembling the petals of ſome of our moſt beautiful flowers. As to one ſpecies particularly, mentioned by Abbe Diequemarre, in the Phil. Tranſ. for 1773, art. 37. the pureſt white, carmine, and ultramarine, are ſaid to be ſcarce ſufficient to expreſs their brilliancy. The bodies of ſome of them are hemiſpherical, of others cylindrical, and of others ſhaped like a fig. Their ſubſtance likewiſe differs; ſome are ſtiff and gelatinous, others fleſhy and muſcular; but all of them are capable of altering their figure when they extend their bodies and claws in ſearch of food. They are found in many of the rocky coaſts of the Weſt India iſlands, and likewiſe on ſome parts of the coaſt of England. They have only one opening, which is in the centre of the uppermoſt part of the animal; round this are placed rows of fleſhy claws; this opening is the mouth of the animal, and is capable of great extenſion. The animals themſelves,

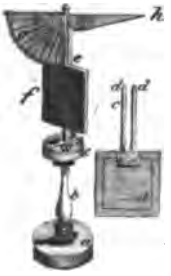
ſelves, though exceedingly voracious, will bear long faſting. They may be preſerved alive a whole year, or perhaps longer, in a veſſel of ſea water, without any viſible food; but, when food is preſented, one of them will ſucceſſively devour two muſcles in their ſhells, or even ſwallow a whole crab as large as a hen's egg. In a day or two the crab ſhell is voided at the mouth, perfectly cleared of all the meat. The muſcle ſhells are likewiſe diſcharged whole, with the two ſhells joined together, but entirely empty, ſo that not the leaſt particle of fiſh is to be perceived on opening them. An anemone of one ſpecies will even ſwallow an individual of another ſpecies; but after retaining it ten or twelve hours, will throw it up alive and uninjured. Through this opening alſo it produces its young ones alive, already furniſhed with little claws, which, as ſoon as they fix themſelves, they begin to extend in ſearch of food. One of the extremities of the ſea-anemone reſembles, the outward leaves of that flower; while its limbs are not unlike the ſhag or inner part of it. By the other extremity it fixes itſelf, as by a ſucker, to the rocks or ſtones lying in the ſand; but it is not totally deprived of the power of progreſſive motion, as it can ſhift its ſituation, though very ſlowly.

(2.) ANIMAL FLOWERS, BARBADOES. In Hughes's Natural Hiſtory of Barbadoes, an account is alſo given of ſeveral ſpecies of animal flowers. They are deſcribed as only found in a baſon in one particular cave; and of the moſt remarkable ſpecies mentioned by him we have the following deſcription. "In the middle of the baſon, there is a fixed ſtone or rock, which is always under water. Round its ſides, at different depths, ſeldom exceeding 18 inches, are ſeen, at all times of the year, iſſuing out of little holes, certain ſubſtances that have the appearance of fine radiated flowers, of a pale yellow, or a bright ſtraw colour, ſlightly tinged with green, having a circular border of thick ſet petals, about the ſize of, and much reſembling, thoſe of a ſingle garden marigold, except that the whole of this ſeeming flower is narrower at the diſcus, or ſetting on of the leaves, than any flower of that kind. I have attempted to pluck one of theſe from the rock, to which they are always fixed; but never could effect it: for as ſoon as my fingers came within two or three inches of it, it would immediately contract cloſe together its yellow border, and ſhrink back into the hole of the rock; but, if left undiſturbed for about four minutes, it would come gradually in ſight, expanding, though at firſt very cautiouſly, its ſeeming leaves, till at laſt it appeared in its former bloom. However, it would again recoil, with a ſurpriſing quickneſs, when my hand came within a ſmall diſtance of it. Having tried the ſame experiment by attempting to touch it with my cane, and a ſmall ſlender rod, the effect was the ſame. Though I could not by any means contrive to take or pluck from the rock one of theſe animals entire; yet I once cut off (with a knife which I had held for a long time out of ſight, near the mouth of an hole out of which one of theſe animals appeared) two of theſe ſeeming leaves. Theſe, when out of the water, retained their ſhape and colour; but, being compoſed of a membrane like ſubſtance, ſurpriſingly thin, it ſoon ſhrivelled up, and decayed."

(3) ANIMAL FLOWERS, CLUSTER. A particular ſpecies of animal flowers has been found in ſome of the iſlands ceded to Britain at the laſt treaty of peace with France; and the following account of them was publiſhed in the Philoſophical Tranſactions, vol. 57. by Mr Ellis, in a letter to Lord Hillſborough. "This compound animal, which is of a tender fleſhy ſubſtance, conſiſts of many tubular bodies, ſwelling gently towards the upper part, and ending like a bulb or very ſmall onion; on the top of each is its mouth, ſurrounded by one or two rows of tentacles, or claws, which when contracted look like circles of beads. The lower part of all theſe bodies have a communication with a firm fleſhy wrinkled tube, which ſticks faſt to the rocks, and ſends forth other fleſhy tubes, which creep along them in various directions. Theſe are full of different ſizes of theſe remarkable animals, which riſe up irregularly in groups near to one another. This adhering tube, that ſecures them faſt to the rock, or ſhelly bottom, is worthy of our notice. The knobs that we obſerve, are formed in ſeveral parts of it by its inſinuating itſelf into the inequalities of the coral rock, or by graſping pieces of ſhells, part of which ſtill remain in it, with the fleſhy ſubſtance grown over them. This ſhows us the inſtinct of nature, that directs theſe animals to preſerve themſelves from the violence of the waves, not unlike the anchoring of muſcles, by their fine ſilken filaments that end in ſuckers; or rather like the ſhelly baſis of the ſerpula, or worm ſhell, the tree oyſter, and the ſlipper barnacle, &c. whoſe baſes conform to the ſhape of whatever ſubſtance they fix themſelves to, graſping it faſt with their teſtaceous claws, to withſtand the fury of a ſtorm. When we view the inſide of this animal diſſected lengthwiſe, we find like a little tube leading from the mouth to the ſtomach, from whence riſe 8 wrinkled ſmall guts, in a circular order, with a yellowiſh ſoft ſubſtance in them; theſe bend over in the form of arches towards the lower part of the bulb, from whence they may be traced downwards, to the narrow part of the upright tube, till they come to the fleſhy adhering tube, where ſome of them may be perceived entering into a papilla, or the beginning of an animal of the like kind, moſt probably to convey it nouriſhment till it is provided with claws: the remaining part of theſe ſlender guts are continued on in the fleſhy tube, without doubt for the ſame purpoſe of producing and ſupporting more young ones from the ſame common parent. The many longitudinal fibres that we diſcover lying parallel to each other, on the inſide of the ſemi-tranſparent ſkin, are all inſerted in the ſeveral claws round the animal's mouth, and are plainly the tendons of the muſcles for moving and directing the claws at the will of the animal: theſe may be likewiſe traced down to the adhering tube. As this ſpecimen has been preſerved in ſpirits, the colour of the animal, when living, cannot be certainly known; it is at preſent of a pale yellowiſh brown. With regard

to

Anemoscope.



Andromeda Paniculata.

Anguis Ventralis.

Anemometer.

Artocarpus — Bread Fruit Tree.

Atropa Mandragora.

Animal Flowers.

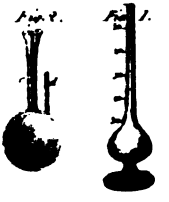
Ardea Pavonia

or Crowned Crane.

Ardea Americana

or Hooping Crane.

Anemometer



Ardea Herodias.

ANIMAL FLOWERS.

Fig. 3.

Fig. 6.

Fig. 2.

Fig. 4.

Fig. 1.

Fig. 5.

ASTERIAS.

Fig. 10. N° 2.

Fig. 10. N° 1.

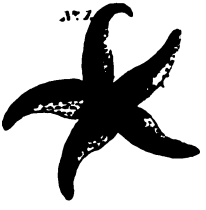


Fig. 9. Ophidia

Fig. 11. N° 2.

Fig. 11. N° 1.

Fig. 13.

Fig. 14. Ophiuridæ

Fig. 12.

Fig. 16. Ophiuri

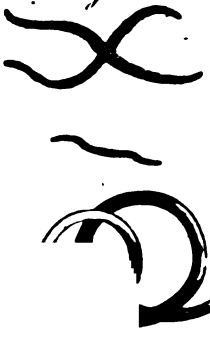


Fig. 15. Ophiles

Fig. 7. Aphis

Fig. 17. Aculeatus

Fig. 8. Aphroditæ Aculeata

to its name, it may be called *actinia ſociata*, or the *Cluſter Animal-flower*."

(4.) ANIMAL FLOWERS, REPRODUCTIVE POWERS OF. The Abbe Dicquemarre, by many curious, though cruel, experiments, related in the Phil. Tranſ. for 1773, has ſhewn, that theſe animals poſſeſs, in a moſt extraordinary degree, the power of reproduction; ſo that ſcarce any thing more is neceſſary to produce as many ſea anemonies as we pleaſe, than to cut a ſingle one into as many pieces. A ſea anemone being cut in two, by a ſection through the body, that part, where the limbs and mouth are placed, ate a piece of a muſcle, offered to it, ſoon after the operation, and continued to feed and grow daily, for three months after. The food ſometimes paſſed thro' the animal; but was generally thrown up again, conſiderably changed, as in the perfect ſea anemone. In about two months, two rows of limbs were perceived growing out of the part where the incision was made. On offering food to this new mouth, it was laid hold of and eat; and the limbs continually increaſing, the animal gradually became as perfect as thoſe which had never been cut. In ſome inſtances, however, he found, that, when one of theſe creatures was cut through, new limbs would be produced from the cut place, thoſe at the mouth remaining as before; ſo that a monſtrous animal was the conſequence, having two mouths, and feeding at both ends. Having put ſome of them into a pan of water, ſet over a ſlow fire, he found that they loſt their life at 50 degrees of Reaumur's thermometer. To avoid the imputation of cruelty in theſe experiments, the author argues the favourable conſequences that have attended his operations on the ſea anemonies, which have been ſo fortunate as to fall into his hands: as he hath not only multiplied their exiſtence, but alſo renewed their youth; which laſt, he adds, "is ſurely no ſmall advantage." The reproductive power of the Barbadoes animal flower is prodigious. Many people coming to ſee theſe ſtrange creatures, and occaſioning ſome inconvenience to a perſon through whoſe grounds they were obliged to paſs, he reſolved to deſtroy the objects of their curioſity; and, that he might do ſo effectually, cauſed all the holes out of which they appeared, to be carefully bored and drilled with an iron inſtrument, ſo that we cannot ſuppoſe but their bodies muſt have been entirely cruſhed to a pulp: nevertheleſs, they again appeared in a few weeks, from the very ſame places. Plate XIV. *a* repreſents the actinia ſociata, or cluſtered animal-flower, deſcribed by Mr. Ellis, with its radical tube adhering to a rock, and one of the animals ſtretching out its claws. *b* A perpendicular diſſection of one of the bodies, to ſhow the gullet, inteſtines, ſtomach, and fibres or tendons that move the claws: with a young one ariſing out of the adhering tube. Plate XIII. Fig. 1. The actinia aſter, or animal-flower of the newly ceded iſlands. Fig. 2. The actinia anemone, or ſea anemone from the ſame place. Fig. 3. The under part of the ſame by which it adheres to the rocks. Fig. 4. The actinia heliathus, or the ſea ſun-flower from ditto. Fig. 5. The under part of the ſame. Fig. 6. The actinia dianthus, or ſea carnation, from the rocks at Haſtings in Suſſex. This animal adheres by its tail or ſucker, to the under part of the projecting rocks oppoſite to the town; and, when the tide is out, has the appearance of a long white fig: this is the form of it, when put into a glaſs of ſea water. It is introduced here, as a new variety of this animal, not yet deſcribed.

(5.) ANIMAL FLOWERS, SCOTTISH. We have already mentioned, under the article ACTINIA, that animal flowers are found in as great beauty and variety, on the coaſt of Galloway, as any where in the Weſt Indies. They are repeatedly taken notice of in Sir J. Sinclair's Statiſtical Account of Scotland. Mr Little, miniſter of Colvend, mentions the polypus or ſea anemone, among the productions of that coaſt.—Mr Muirhead, miniſter of Urr, gives the following particular deſcription of them. "About five years ago, I diſcovered in the pariſh of Colvend, the animal flower, in as great perfection and variety, as it is in Jamaica. The lively colours, and the various and elegant forms of the polypus on this coaſt, are truly equal to any thing related by natural hiſtorians, reſpecting the ſea flowers of any other country. To ſee a flower of purple, of green, blue, yellow, &c. ſtriving to catch a worm is really amuſing."—And Mr Marſhall, miniſter of Buittle, has allotted a ſection of his Statiſtical Account of his pariſh to *animal flowers*; wherein he ſays, "Till of late, perhaps it has not been much adverted to, that the animal flower, or water polypus, is even common alongſt the ſhores of Buittle, Colvend, and very likely around the whole coaſt of the Stewartry of Galloway. The form of theſe polypuſes is elegant and pleaſantly diverſified. Some are found reſembling the ſun-flower, ſome the hundred-leaved roſe, but the greater number bear the likeneſs of the poppy. The colours differ as much as the form. Sometimes the animal flower is of a deep purple, frequently of a roſe colour, but moſtly of a light red or fleſhy hue. The moſt beautiful of them, that could be picked up, have often been carried from the ſhore of Colvend, 12 or 15 miles up into the country, where they have lived, fed on worms, and even bred for ſeveral weeks, and might have exiſted much longer, if they could have been ſupplied with ſea water. In a word, it ſeems probable, that an induſtrious naturaliſt might diſcover, on this coaſt, ſome of thoſe ſingular animals, not much inferior to thoſe produced in the Antilles, and other tropical countries."

ANIMAL FOOD. See FOOD.

ANIMAL FOSSILE SUBSTANCES, thoſe found buried in the earth, at various depths, and embodied among various ſtrata. Theſe are principally of four kinds: 1. Sea ſhells. 2. The teeth, bony palate, and bones of fiſhes. 3. The bones of land animals. And, 4. Complete fiſh. See FOSSILS.

ANIMAL GODS, *dii animales*, in mythology, thoſe into which human ſouls were ſuppoſed to be converted, by means of certain religious ceremonies. Labeo wrote a treatiſe, expreſsly on the animal gods.

ANIMAL HEAT. See HEAT.

ANIMAL MAGNETISM. See MAGNETISM.

ANIMAL

ANIMAL MOTION is the ſame with MUSCULAR MOTION. See ANATOMY, INDEX.

ANIMAL OECONOMY. See ANATOMY, INTRODUCTION, SECT. III.

ANIMALS, PAIRING OF. See PAIRING.

ANIMALS, PREPARATION OF, FOR COLLECTIONS OR MUSEUMS. See QUADRUPEDS, BIRDS, REPTILES.

ANIMAL SECRETION is the act whereby the divers juices of the body are ſecreted or ſeparated from the common maſs of blood, by means of the glands. See ADENOLOGY, under ANATOMY, INDEX.

ANIMAL SPIRIT. See NERVOUS FLUID.

ANIMAL SYSTEM denotes the whole claſs of beings endowed with animal life, otherwiſe called ANIMAL KINGDOM.

ANIMALCULA. See ANIMALCULES.

ANIMALCULAR, *adj.* belonging to an animalcule.

(1.) * ANIMALCULE. *n. ſ.* [*animalculum*, Lat.] A ſmall animal; particularly thoſe which are in their firſt and ſmalleſt ſtate.—We are to know, that they all come of the ſeed of *animalcules* of their own kind, that were before laid there. *Ray.*

(2.) ANIMALCULE, FARTHER DEFINITION OF AN. The word in general, ſignifies a little animal; and thus the term might be applied to every animal which is conſiderably inferior in ſize to ourſelves. It hath been cuſtomary, however, to diſtinguiſh by the name of *animalcules* only ſuch animals as are of a ſize ſo diminutive, that their true figure cannot be diſcerned without the aſſiſtance of glaſſes: and more eſpecially it is applied to ſuch as are altogether inviſible to the naked eye, and cannot even be perceived to exiſt but by the aſſiſtance of microſcopes. By the help of magnifying glaſſes, we are brought into a kind of new world; and numberleſs animals are diſcovered, which from their minuteneſs muſt otherwiſe for ever have eſcaped our obſervation: and how many kinds of theſe inviſibles there may be, is ſtill unknown; as they are diſcerned of all ſizes, from thoſe which are barely inviſible to the naked eye, to ſuch as reſiſt the action of the microſcope, as the fixed ſtars do that of the teleſcope, and with the beſt magnifiers hitherto invented appear only as ſo many moving points. The ſmalleſt living creatures our inſtruments can ſhow are thoſe that inhabit the waters: for though poſſibly animalcules equally minute, or perhaps more ſo, may fly in the air, or creep upon the earth, it is ſcarce poſſible to bring ſuch under our examination; but, water being tranſparent, and confining the creatures in it, we are able, by applying a drop of it to our glaſſes, to diſcover, to a certain degree of ſmallneſs, all that it contains.—Some of the moſt curious of theſe animalcules, which have been deſcribed by microſcopical obſervers, we ſhall here give an account of. See § 3—16.

(3.) ANIMALCULES IN PASTE, VINEGAR, &c. When paſte is allowed to ſtand till it becomes ſour, it is then found to be the habitation of numberleſs animalcules, like eels, which may be diſcerned by the naked eye; and though their form cannot be perfectly diſtinguiſhed, their motion is very perceptible, and the whole paſte will ſeem to be animated. Fig. 4 repreſents one of theſe anguillæ magnified. The moſt remarkable property of theſe inſects is, that they are viviparous. If one of them is cut through near the middle, ſeveral oval bodies of different ſizes will be ſeen to iſſue forth. Theſe are young anguillæ, each of them coiled up and incloſed in its proper membrane, which is ſo exquiſitely fine, as ſcarcely to be diſcernible by the greateſt magnifier, while it incloſes the embryo animal. The largeſt and moſt forward immediately break through this covering, unfold themſelves, and wriggle about in the water nimbly; others get out, uncoil, and move themſelves about more ſlowly; and the leaſt mature continue entirely without motion. The *uterus*, or veſſel that contains all theſe oval bodies, is compoſed of many ringlets, not unlike the aſpera arteria of land animals, and ſeems to be conſiderably elaſtic; for as ſoon as the animalcule is cut in two, the oval bodies are thruſt out with ſome degree of violence, from the ſpringing back or action of this bowel. Upwards of 100 young ones have been ſeen to iſſue from the body of one ſingle eel, whereby the prodigious increaſe of them may be accounted for; as probably ſeveral ſuch numerous generations are produced in a ſhort time. They ſeem to be all prolific; and unleſs the trial happens to be made upon one that has brought forth all its young, or when the paſte has been kept for a very long time, the experiment will always ſucceed.—This property of theſe eels being viviparous renders it highly improbable that they ever become flies. Animalcules of a ſimilar kind are likewiſe found in vinegar; and, like thoſe already deſcribed, are found to be viviparous.

(4.) ANIMALCULES IN WHEAT. It is not only in acids that animalcules are ſeen. In ſome fields of wheat, many grains may be obſerved, that appear blackiſh outwardly, as if ſcorched; but, when opened, are found to contain a ſoft white ſubſtance, which attentively conſidered, appears to be nothing elſe than a congeries of threads or fibres lying cloſe to each other in a parallel direction, much reſembling the unripe down of ſome thiſtles on cutting open the flower heads before they begin to blow. This fibrous matter diſcovers not the leaſt ſign of life or motion, unleſs water is applied; but immediately on wetting, provided the grains of wheat have been newly gathered, the ſuppoſed fibres ſeparate, and appear to be living creatures. Their motions at firſt are very languid; but gradually become more vigorous, twiſting and wringing themſelves ſomewhat in the manner of the eels in paſte, but always ſlower than they, and with a great deal of leſs regularity. If the grains of wheat are grown dry by keeping, and in that condition are cut open, the fibrous matter is very diſtinguiſhable; and, on putting water to it, will ſeparate with great readineſs, and ſeem like fine tubes or threads tapering at both ends; but not the leaſt motion will be perceived till they have been in water for ſeveral hours, and ſometimes they will never move at all. But if the ſame grains are ſteeped in water for three or four hours, or buried for ſome days in the earth till they are fully ſaturated with moiſture, and then opened with a penknife; on taking out a ſmall portion of the white matter carefully, and ſpreading it thin upon a ſlip of glaſs, the animal-

cules will be ſeen bundled together, and extended longitudinally but without motion; and though, upon the application of water, they will not revive ſo ſoon as thoſe taken from freſh grains whoſe moiſture has never been exhaled; yet, after remaining an hour or two in the water, they are conſtantly found alive and vigorous, even though the grains have been kept in a dry condition for ſeveral years. It is neceſſary, however, to adapt, in ſome meaſure, the time of continuing the grains in water or earth to the age and dryneſs of them; for if they are not opened before they are too much ſoftened, the animalcules will be dead; and unleſs the huſks are opened to let thoſe creatures out after they have been ſteeped, they inevitably periſh in them: otherwiſe, they will continue alive in water for many months; and, ſhould the water dry away, may be revived again by giving them a freſh ſupply.

(5.) ANIMALCULES OF INFUSION, ANIMALCULA INFUSORIA, take their name from being found in all kinds either of vegetable or animal infuſions. Indeed, there is ſcarce any kind of water, unleſs impregnated with ſome mineral ſubſtance, but what will diſcover living creatures.—Mr Lewenhoek ſays, that at firſt he could diſcern no living creatures in rain water; but after ſtanding ſome days, he diſcovered innumerable animalcules, many thouſands of times leſs than a grain of ſand, and in proportion to a mite as a bee is to a horſe. In other rain water, which had likewiſe ſtood ſome time, he found the ſmalleſt ſort he had ever ſeen; and, in a few days more, met with others eight times as big as theſe, and almoſt round.—In another quantity of rain water, that had been expoſed like the former, he diſcovered a kind of animalcules with two little horns in continual motion. The ſpace between the horns was flat, though the body was roundiſh, but tapering a little towards the end; where a tail appeared, four times as long as the body, and the thickneſs of a ſpider's web. He obſerved ſeveral hundreds of theſe within the ſpace a grain of ſand would occupy. If they happened on the leaſt filament or ſtring, they were entangled in it; and then would extend their bodies into an oblong round, and ſtruggle hard to diſengage their tails. He obſerved a ſecond ſort of an oval figure, and imagined the head to ſtand at the ſharpeſt end. The body was flat, with ſeveral ſmall feet moving exceeding quick, but not diſcernible without a great deal of attention. Sometimes they changed their ſhape into a perfect round, eſpecially when the water began to dry away. He met alſo with a third ſort, twice as long as broad, and eight times ſmaller than the firſt: yet in theſe he diſcerned little feet, whereby they moved very nimbly. He perceived likewiſe a fourth ſort, a thouſand times ſmaller than a louſe's eye, and which exceeded all the reſt in briſkneſs; he found theſe turning themſelves round, as it were upon a point, with the celerity of a top. And he ſays, there were ſeveral other ſorts. The production of *animalcula infuſoria* is very ſurpriſing. In four hours time, an infuſion of cantharides has produced animalcula leſs than even the tails of the ſpermatic animals deſcribed in the next ſection. Neither do they ſeem to be ſubject to the fate of other animals; but, ſeveral kinds of them at leaſt, by dividing themſelves in two, enjoy a ſort of immortality. Nor do the common methods by which other animals are deſtroyed, ſeem to be effectual for deſtroying their vital principle. Hot mutton gravy, ſecured in a phial with a cork, and afterwards ſet among hot aſhes to deſtroy as effectually as poſſible every living creature that could be ſuppoſed to exiſt in it, has nevertheleſs been found ſwarming with animalcules after ſtanding a few days. In the Philoſophical Tranſactions, Vol. LIX. we have the following curious account, given us by Mr Ellis, of animalcules produced from an infuſion of potatoes and of hempſeed. "On the 25th of May 1768, Fahrenheit's thermometer 70°, I boiled a potatoe in the New River water till it was reduced to a meally conſiſtence. I put part of it, with an equal proportion of the boiling liquor into a cylindrical glaſs veſſel that held ſomething leſs than half a wine pint, and covered it cloſe immediately with a glaſs cover. At the ſame time, I ſliced an unboiled potatoe; and, as near as I could judge, put the ſame quantity into a glaſs veſſel of the ſame kind; with the ſame proportion of New River water not boiled; and covered it with a glaſs cover; and placed both veſſels cloſe to each other. On the 26th of May, 24 hours afterwards, I examined a ſmall drop of each, by the firſt magnifier of Wilſon's microſcope, whoſe focal diſtance is reckoned at one fiftieth part of an inch; and, to my amazement they were both full of animalcula of a linear ſhape, very diſtinguiſhable, moving to and fro with great celerity; ſo that there appeared to be more particles of animal than vegetable life in each drop. This experiment I have repeatedly tried, and always found it to ſucceed in proportion to the heat of the circumambient air; ſo that even in winter, if the liquors are kept properly warm, at leaſt in two or three days the experiment will ſucceed. What I have obſerved, are infinitely ſmaller than ſpermatic animals, and of a very different ſhape; the truth of which every accurate obſerver will ſoon be convinced of, whoſe curioſity may lead him to compare them; and I am perſuaded he will find they are no way akin. At preſent I ſhall paſs over many other curious obſervations, which I have made on two years experiments, in order to proceed to the explaining a hint which I received laſt January from Mr De Sauſſure of Geneva, when he was here; which is, that he found one kind of theſe animalcula infuſoria that increaſe by dividing acroſs into nearly two equal parts. I had often ſeen this appearance in various ſpecies a year or two ago, as I found upon looking over the minutes I had taken when I made any new obſervation; but always ſuppoſed the animal, when in this ſtate, to be in coition. Not hearing, till after M. De Sauſſure left this kingdom, from what infuſion he had made his obſervation, his friend Dr de la Roche of Geneva informed me, the latter end of February laſt, that it was from hempſeed. I immediately procured hempſeed from different ſeedſmen in diſtant parts of the town. Some of it I put into New River water, ſome into diſtilled water, and ſome I put into very hard pump-water. The reſult was, that in proportion to the heat of the weather, or the warmth in which they

were kept, there was an appearance of millions of minute animalcula in all the infusions; and sometime after, some oval ones made their appearance, as at fig. 3. *b c*. These were much larger than the first, which still continued; these wriggled to and fro in an undulatory motion, turning themselves round very quick all the time that they moved forwards. I was very attentive to see these animals divide themselves; and at last I perceived a few of the appearance of fig. 3. *a*, Pl. XII. as represented by the first magnifier of Wilson's microscope; but I am so well convinced by experience that they would separate, that I did not wait to see the operation: however, as the following sketches, which I have drawn from five other species, will very fully explain this extraordinary phenomenon, there will be no difficulty in conceiving the manner of the first. See Pl. XII. fig. 4, 5, 6, 7, 8. The proportion of the number of these animals which I have observed to divide in this manner, to the rest, is scarce 1 to 50; so that it appears rather to arise from hurts received by some few animalcula among the many, than to be the natural manner in which these kinds of animals multiply; especially if we consider the infinite quantity of young ones which are visible to us through the transparent skins of their bodies, and even the young ones that are visible in those young ones while in the bodies of the old ones.—But nothing more plainly shows them to be zoophites than this circumstance, That when, by accident, the extremity of their bodies has been shrivelled for want of a supply of fresh water, the applying more fresh water has given motion to the part of the animal that was still alive; by which means, this shapeless figure has continued to live and swim to and fro while it was supplied with fresh water."

(6.) ANIMALCULES, SPERMATIC. The discovery of living animalcules in the semen of most animals is claimed by Mr Lewenhoek and Mr Nicholas Hartsoeker; who both say they published it about the end of the year 1677 or beginning of 1678: but Mr Lewenhoek having given the most particular description of, and made by far the greatest number of experiments concerning them, the discovery is commonly attributed to him.—According to this naturalist, these animalcules are found in the semen masculinum of every kind of animal; but their general appearance is very much the same, nor doth their size differ in proportion to the bulk of the animal to which they belong. The bodies of all of them seem to be of an oblong oval form, with long tapering slender tails issuing from them; and as by this shape they resemble *tadpoles*, they have been frequently called by that name; though the tails of them, in proportion to their bodies, are much longer than the tails of tadpoles are: and it is observable, that the animalcules in the semen of fishes have tails much longer and more slender than the tails of those in other animals; insomuch, that the extremity of them is not to be discerned without the best glasses, and the utmost attention. Pl. XII. Fig. 21. N° 1, 2, 3, 4, represent the spermatic animalcula of the rabbit; and N° 5, 6, 7, 8, those of a dog; according to Mr Lewenhoek.—The numbers of these animalcula are inconceivable. On viewing with a microscope the milt or semen masculinum of a living cod-fish, innumerable multitudes of animalcules were found therein, of such a diminutive size, that he supposed at least 10,000 of them capable of being contained in the bulk of a grain of sand; whence he concludes, that the milt of this single fish contained more living animalcules than there are to be found people living in the whole world. To find the comparative size of these animalcules, Mr Lewenhoek placed an hair of his head near them; which hair, through his microscope, appeared an inch in breadth; and he was satisfied, that at least 60 such animalcules could easily lie within that diameter; whence, their bodies being spherical, it follows, that 216,000 of them are but equal to a globe whose diameter is the breadth of a hair. He observed, that when the water wherewith he had diluted the semen of a cod-fish was exhaled, the little bodies of the animalcules burst in pieces; which did not happen to those in the semen of a ram: and this he imputes to the great firmness and consistency of the latter, as the flesh of a land animal is more compact than fish. These animalcules appear to be very vigorous, and tenacious of life; for they may be observed to move long after the animal from which they are taken is dead. They have this peculiarity also, that they are continually in motion, without the least rest or intermission, provided there is fluid sufficient for them to swim about in. These animalcula are peculiar to the semen: nothing that has the least token of life being discovered by the best glasses, either in the blood, spittle, urine, gall, or chyle. Great numbers, however, are to be found in the whitish matter that sticks between the teeth; some of which are of an oval figure, and others resemble eels.

(7.) ANIMALCULE, THE AQUATIC WORM. This animalcule is shown magnified, Pl. XI. fig. 31. It is found in ditch water; and is of various sizes, from one 40th to one half of an inch in length. About the head it has somewhat of a yellowish colour; but all the rest of the body is perfectly colourless and transparent, except the intestines, which are considerably opaque, and disposed as in the figure. Along its sides are several papillæ, with long hairs growing from them: it has two black eyes, and is very nimble. But the most remarkable thing in this creature is a long horn or proboscis; which in the large ones, may be seen with the naked eye if the water is clear, and is sometimes one tenth of an inch in length: this it waves to and fro as it moves in the water, or creeps up the side of the glass; but it is not known whether it is hollow or of what use it is to the creature itself.

(8.) ANIMALCULE, THE BELL-FLOWER, OR PLUMED POLYPE. These animalcules dwell in colonies together, from ten to fifteen (seldom falling short of the former number, or exceeding the latter), in a slimy kind of mucilaginous or gelatinous case; which, out of the water, has no determined form, appearing like a little lump of slime; but when expanded therein, has some resemblance to the figure of a bell with its mouth upwards; and is usually about half an inch long, and a quarter of an inch in diameter. These bells, or colonies, are to be found adhering to the large leaves of duckweed, and other aquatic plants. They may be most easily discovered by letting a quantity of water

Fig. 1.
Fig. 2.
Fig. 3.
Fig. 4.
Fig. 5.
Fig. 6.
Fig. 7.
Fig. 8.
Fig. 9.
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Fig. 32.
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Fig. 35.
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Fig. 37.
Fig. 38.
Fig. 39.
Fig. 40.
Fig. 41.
Fig. 42.
Fig. 43.

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4

Fig. 5

Fig. 6.

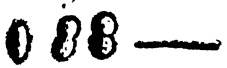

Fig. 7.

Fig. 8.

Fig. 9.

Fig. 10.

Fig. 11.

Fig. 12.

Fig. 13.

Fig. 14.

Fig. 15.

Fig. 16.

Fig. 17.

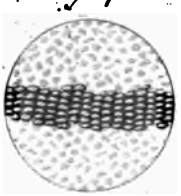

Fig. 18.

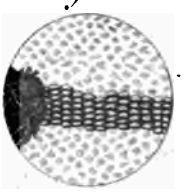

Fig. 19.

Fig. 21.

Spermatic Animalcula of the Dog. | Spermatic Animalcula of the Rabbit.

according to the first Edition of Leeuwenhoek.

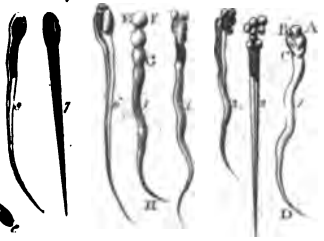

Fig. 22. N. 1.

Anguinum Orium.

Fig. 20.

N. 2.

N. 3.

Engraved for Encyclopedia Perthensis.

water, with duckweed in it, ſtand quietly for 3 or 4 hours in glaſs veſſels in a window, or other place whence a ſtrong light comes: for then, if any are about the duckweed, they will be found, on careful inſpection, extending themſelves out of their caſes, and making an elegant appearance.—The bell, or caſe, which theſe animals inhabit, being very tranſparent, all the motions of its inhabitants may be diſcerned through it diſtinctly. It ſeems divided internally into ſeveral apartments, or rather to contain ſeveral ſmaller ſacculi, each of which incloſes one of theſe animals. The openings at the tops of theſe ſacculi, are but juſt ſufficient to admit the creature's head and a ſmall part of its body to be thruſt out beyond them, the reſt remaining always in the caſe. It can, however, occaſionally retire in its caſe altogether: and never fails to do ſo when alarmed by any ſudden motion of the water, or of the veſſel which contains it.—Beſides the particular and ſeparate motion which each of theſe creatures is able to exert within its own caſe, and independent of the reſt; the whole colony together has a power of altering the poſition of the bell, or even of removing it from one place to another; and hence this bell is ſometimes found ſtanding perfectly upright, as in Pl. XI. fig. 29, 33. and ſometimes bending the upper part downwards, as in fig. 30. As theſe animalcules ſeem not to chooſe to ſtay together in ſocieties whoſe number exceeds 15, when the colony happens to increaſe in number, the bell may be obſerved to ſplit gradually, beginning from about the middle of the upper or anterior extremity, and proceeding downwards towards the bottom, as in fig. 32. till they at laſt ſeparate entirely, and become two complete colonies independent of each other, one of which ſometimes removes to another part of the veſſel. The arms of each individual of this colony are ſet round the head, to the number of 40, having each the figure of an Italic *ſ*, one of whoſe hooked ends is faſtened to the head; and all together, when expanded, compoſe a figure ſhaped ſomewhat like a horſe's ſhoe, convex on one ſide next the body, but gradually opening and turning outwards, ſo as to leave a conſiderable area within the outer extremities of the arms. When the arms are thus extended, the creature, by giving them a vibrating motion, can produce a current in the water, which brings the animalcules, or whatever other minute bodies are within the ſphere of its action, with great velocity to its mouth, ſituated between the arms; where they are taken in if liked, or driven away by a contrary motion. The food is conveyed immediately from the mouth or opening between the arms, through a narrow neck, into a paſſage ſeemingly correſpondent to the œſophagus in land animals; down which it paſſes into the ſtomach, where it remains for ſome time, and then is voided upwards, in ſmall round pellets, through a gut whoſe exit is near the neck. The body conſiſts of three diviſions; in the uppermoſt of which are contained all the above-mentioned inteſtines, which are only to be diſcerned when the creature is full, at which time they become opaque. The other two diviſions, which are probably fixed to the bell, ſeem to be of no other uſe than to give the creature a power of contraction and extenſion. The arms are not able to contract like thoſe of the common polype; but, when the animal retires into its caſe, they are brought together in a cloſe and curious order, ſo as to be eaſily drawn in. Though their general appearance when expanded is that of a cup whoſe baſe and top are of an horſe ſhoe form, they ſometimes ſeparate into four parts, and range themſelves as in fig. 36. ſo as to reſemble four ſeparate plumes of feathers. Though their eyes cannot be diſcovered, yet Mr Baker thinks they have ſome perception of the light: for when kept in the dark, they always remain contracted; but on being expoſed to the light of the ſun or of a candle, they conſtantly extend their arms, and ſhow evident ſigns of being pleaſed. Fig. 29. repreſents one complete colony or bell ſtanding erect, with all the animals out of their kingdom, and their arms extended, exhibiting all together a very pretty appearance. *a* repreſents two oval bodies, ſuppoſed by Mr Baker to be eggs. Fig. 30. ſhows all the creatures withdrawn into their cells, and the end of the bell hanging downwards. Fig. 33. ſhows the bell erect, with only one of the animals coming out, in order to ſhow its connection with the bell. Fig. 34. ſhows the head and arms of a ſingle polype cloſing together, and diſpoſing themſelves in order to be drawn into the bell. Fig. 35. ſhows one complete animal greatly magnified, to ſhow its ſeveral parts more diſtinctly; viz. *a*, the head, reſembling a horſe ſhoe; *b b*, the arms ſeen from one ſide; *c*, the narrow neck; *d*, the œſophagus; *e*, the ſtomach; *f*, the gut or laſt inteſtine through which the food paſſes after being digeſted in the ſtomach; *g*, the anus, where the feces are diſcharged in the little pellets: *h i*, that part of the bell which ſurrounds the body of the animal, and cloſes upon it when it retires down. Fig. 37. the head and arms ſeen in front.

(9.) ANIMALCULE, THE BEROE. Mr Ellis, in deſcribing this Animalcule, complains, that "the excellent Linnæus has joined the *beroe* with the *volvox*, one of the animalcula infuſoria. The beroe is a marine animal, found on our coaſts; of a gelatinous tranſparent nature, and of an oval or ſpherical form, about half an inch to an inch diameter; divided like a melon into longitudinal ribs, each of which is furniſhed with rows of minute fins; by means of which, this animal, like the animalcula infuſoria, can ſwim in all directions with great ſwiftneſs. In the ſame manner I have ſeen moſt of thoſe minute animals move ſo ſwift that we could not account for it, without ſuppoſing ſuch a proviſion in nature, which is really true, but cannot be ſeen till the animals grow faint for want of water; then, if we attend, we may with good glaſſes plainly diſcover them. I have lately found out, by mere accident, a method to make their fins appear very diſtinctly, eſpecially in the larger kind of animalcula, which are common to moſt vegetable infuſions; ſuch as the terebella. This has a longiſh body, with a cavity or groove at one end, like a gimlet: by applying, then, a ſmall ſtalk of the horſe ſhoe geranium (or geranium zonale of Linnæus), freſh broken, to a drop of water in which theſe animalcula are ſwimming, we ſhall find that they will be-

and tail; with thoſe at the head, it whirls the water about to draw its prey to it; the feet, which are many, are very viſible, but remarkably ſo in a ſide-view at (d). At (b) it is repreſented beginning to divide; and at (c) the animals are ready to part: in this ſtate, as if in exquiſite pain, they ſwim round and round, and to and fro, with uncommon velocity, violently agitated till they get aſunder. This was found in an infuſion of different kinds of pine branches. Fig. 7 is the volvox terebella, or the gimlet. This is one of the largeſt of the kind, and is very viſible to the naked eye. It moves along ſwiftly, turning itſelf round as it ſwims, juſt as if boring its way. (a) and (b) are two views of its natural ſhape, (c) ſhows the manner of its dividing. When they are ſeparated, the lower animal rolls very awkwardly along, till it gets a groove in the upper part. (d) repreſents one of them lying torpid, by means of the juice of the horſe-ſhoe geranium, with its fins extended. This animal is found in many infuſions, particularly in graſs or corn. Fig. 8. is the volvox, vorax, or glutton. This animal was found in an infuſion of the Tartarian pine; it varies in ſhape very much, contracting and extending its proboſcis, turning it to and fro, in various directions, as at a, b, c, d, e. It opens its proboſcis underneath the extremity, when it ſeizes its prey. The leſs active animals, that have been divided, ſuch as thoſe at fig. 3. (a), and at fig. 4. (a), ſerve it as food, when they come in its way: theſe it ſwallows down inſtantly, as it is repreſented at fig. 8. h and i. At (f) it is ready to divide, and at (g) it is divided; where the hinder-part of the divided animal has got a proboſcis or beak, to procure nouriſhment for itſelf, and ſoon becomes a diſtinct being from the fore part.

(16.) ANIMALCULE, THE VORTICELLA, OR WHEEL. This animalcule is found in rain water that has ſtood ſome days in leaden gutters, or in hollows of lead on the tops of houſes; or in the ſlime or ſediment left by ſuch water; and perhaps may alſo be found in other places: but if the water ſtanding in gutters of lead, or the ſediment left behind it, has any thing of a lead colour in it, one may be almoſt certain of finding them therein. Though it diſcovers no ſigns of life except when in the water, yet it is capable of continuing alive for many months after it is taken out of the water, and kept in a ſtate as dry as duſt. In this ſtate it is of a globular ſhape, exceeds not the bigneſs of a grain of ſand, and no ſigns of life appear; but being put into water, in half an hour, a languid motion begins, the globule turns itſelf about, lengthens itſelf by ſlow degrees, aſſumes the form of a lively maggot, and moſt commonly in a few minutes afterwards puts out its wheels; ſwimming vigorouſly through the water, as if in ſearch of food; or fixing itſelf by the tail, works the wheels in ſuch a manner as to bring its food to it. Pl. XL. Fig. 23. and 24. ſhow the wheel animalcule, in its globular form; fig. 11, and 12. in its maggot ſtate; and fig. 13, 14, 15, 16, 17, 18, 19, 20, 21, and 22, ſhow the different appearances of its wheels, and alſo its various intermediate changes between the globular and maggot ſtate. The moſt remarkable part of this animalcule is its wheel work. This conſiſts of a couple of ſemicircular inſtruments, round the edges of which many little fibrillæ move themſelves very briſkly, ſometimes with a kind of rotation, and ſometimes in a trembling or vibrating manner. When in this ſtate, it ſometimes unfaſtens its tail, and ſwims along with a great deal of ſwiftneſs, ſeemingly in purſuit of its prey. Sometimes the wheels ſeem to be entire circles, armed with ſmall teeth like thoſe of the balance-wheel of a watch, appearing projected forwards beyond the head, and extending ſideways, ſomewhat wider than its diameter. The teeth or cogs of theſe wheels ſeem to ſtand very regularly at equal diſtance: but the figure of them varies according to their poſition, the degree of their protruſion, and perhaps the will of the animal itſelf. They appear ſometimes like minute oblong ſquares, ariſing at right angles from the periphery of a circle, like ancient battlements on a round tower; at other times they terminate in ſharp points, and altogether reſemble a kind of Gothic crown. They are often ſeen in a kind of curvular direction, all bending the ſame way, and ſeeming like ſo many hooks; and now and then the ends of them will be perceived to be clubbed like mallets. This figure, however, as well as the firſt, they aſſume but rarely. As thoſe wheels are every where exceſſively tranſparent, except about their circular rim or edge, where the cogs are ſet, it is very difficult to determine by what contrivance they are turned about, or what their real figure is, though they ſeem exactly to reſemble wheels moving round upon an axis. It is alſo hardly poſſible to be certain whether thoſe circular bodies in which the teeth are ſet, are of a flat form, or hollow and conical; but they ſeem rather to be of a conical figure. The difficulty of conceiving how an articulation could be conceived ſo as to cauſe a real rotation, hath cauſed many people imagine that there was a deception in this caſe: But Mr Baker aſſures us, that when the wheels are fully protruded, they never fail to ſhow all the viſible marks of a regular rotation; and, in ſome poſitions, the ſame cogs or teeth may be traced by the eye during a complete revolution. All the actions of this creature ſeem to imply ſagacity and quickneſs of ſenſation. At the laſt touch or motion in the water, they inſtantly draw in their wheels; and Mr Baker conjectures, that their eyes are lodged ſomewhere about the wheels: becauſe, while in the maggot ſtate, its motions are ſlow and blundering; but after the wheels are protruded, they are performed with great regularity, ſwiftneſs, and ſteadineſs. Notwithſtanding the minuteneſs of this animalcule, the microſcope generally diſcovers others in the ſame drop of water, compared with which the wheel animal may be ſaid to be a whale. The tranſparency of its body allows its internal parts to be ſeen, which cannot be perceived in the minuteſt animalcules on account of the ſmallneſs of their ſize. *Fig.* 15. *a*, Is the appearance of the head; and though it is every where tranſparent, a ring or circle more particularly remarkable for its clearneſs is commonly perceived about the middle of the forehead, a little above the mouth. This, Mr Baker thinks, might juſtly be called the ſeat of the brain. Many veſſels which ſeem to take their origin from thence

are

are diſcernible in the head, where ſome tranſparent fluid appears continually agitated by a kind of fluctuating motion. The thorax, *b*, is joined to the head by a very ſhort neck, *c*, and appears to be about the ſixth part of the whole length of the animal. In the middle of the thorax is placed the heart, *d*, where its ſyſtole and diaſtole is plainly viſible. It is ſeen through the back of the inſect, ſhutting and opening alternately with great regularity and exactneſs. Its ſize is proportionable to the creature's bigneſs; and its ſhape, during the ſyſtole, is nearly circular, being compoſed ſeemingly of two ſemilunar parts, which then approach each other laterally, and form between them a roundiſh or horſe-ſhoe like figure, whoſe upper ſide is flat, and the under one convex. The diaſtole is performed by a ſeeming ſeparation, or opening, of theſe two ſemilunar parts, whereby the tranſverſe diameter of the heart is very much enlarged. This ſeparation begins exactly in the middle of the lower part next the tail; and opens to ſuch a conſiderable width upwards, that the two parts, when at their utmoſt diſtenſion, ſeem only joined by an arched veſſel at their anterior end. The alternate motions of contraction and dilatation are performed with great ſtrength and vigour, in pretty much the ſame time as the pulſation of the arteries of a man in health. The motions of the heart are communicated to all the internal parts of the thorax; and ſeem to extend a great deal further; for a ſtrict examination diſcovers, at the ſame time, throughout the whole animal, contractions and dilatations going on, that are apparently correſpondent thereto. Theſe motions of the heart, however, are ſometimes ſuſpended, or imperceptible, for two or three minutes; after which they are renewed, and go on again with the ſame regularity as before. From the under part of the thorax proceeds a ſmall tranſparent horn repreſented at *a fig.* 11. and 12. It is never viſible but when the animal turns on its back or ſide.—The blood or circulating fluid of the wheel animal is ſo abſolutely colourleſs, that the current of it through the veſſels is not diſtinguiſhable by glaſſes. A ſort of irregular agitation of ſome fluid is indeed perceived, which is perhaps a compound motion of currents running different ways, and forming ſuch an appearance, though no ſingle current is any where diſtinctly viſible.—Immediately below the thorax is another annular diviſion, *e*, joining upwards to the thorax, and downwards to the abdomen, the entrance whereof it ſerves occaſionally to enlarge or diminiſh. The abdomen, *f*, is by much the largeſt part of the animal, and contains the ſtomach and inteſtines. When the inſect is full of food, theſe bowels appear opaque and of a blood red colour, extending quite through the belly and great part of the tail, and exhibiting a variety of contractions and dilatations. The belly is capable of ſtretching out greatly in length, or being ſhortened very much, and widening its diameter. It aſſumes many ſhapes, and becomes occaſionally a caſe for all the other parts of the body.—Beſides the above-mentioned one, there are found in the waters ſeveral other ſpecies of animals furniſhed with wheels, ſome of which appear to have a rotatory, and others a vibratory, motion. *Fig.* 25. repreſents a kind found in the ditch at Norwich, where the hair-like inſect is produced. They differ from the foregoing only in having very long tails. *Fig.* 26, 27, and 28, repreſent a ſpecies of wheel-animals, which are alſo covered with ſhells. The body of this ſpecies conſiſts of three parts, in like manner as the other; only the thorax and abdomen, in this, are not ſeparated by any gut, or intermediate veſſel, but are joined immediately together. The heart is plainly perceived, having a regular ſyſtole and diaſtole, at *a*, as in the former ſpecies. Theſe creatures occaſionally draw themſelves entirely within their ſhells; and the ſhell then appears terminated by ſix ſhort ſpikes on one ſide and two on the other.—The young of this ſpecies are carried in oval ſacculi, or integuments, faſtened externally to the lower part of their ſhells ſomewhere about the tail; theſe ſacculi are ſometimes opaque only at one end, and ſeemingly empty at the other; ſometimes they appear opaque in the middle, with a tranſparency all round, as in *fig.* 26. When a young one is about to burſt its integuments, the parent aſſiſts it greatly, by wagging its tail, and ſtriking the oval bag, ſo that the young one's head becomes as it were forced into the water, though the tail cannot be ſo ſoon diſengaged. *Fig.* 28. *b.* In this condition the young one ſets its wheel a-going, and exerts all its endeavours to free itſelf from its confinement. When it has got clear, it ſwims away, wagging its tail as the old one does, and leaving the integument adhering to the ſhell of the parent. The old one then uſes a number of efforts to get rid of this incumbrance, ſtriking againſt it with her tail, fixing the end of her tail upon it, and then darting her body forward; with ſeveral very odd motions not eaſy to be deſcribed. This kind of wheel-animals are great tormentors of the water-flea, *Pulex aquaticus arboreſcens* of Swammerdam; of which a figure is given from that author, in *Plate* XII.: *fig.* 2. ſhows the natural ſize of the flea; and *fig.* 1. ſhows it magnified, with ſome of the wheel-animals adhering to it. Theſe inſects are often found in great numbers in the ſame water: and when that is the caſe, it is not uncommon to diſcover five or ſix of theſe cruſtaceous wheel animals faſtened by their tail to the ſhell or horns of the flea; cauſing it, ſeemingly, a vaſt deal of uneaſineſs; nor can they be driven away, or ſhaken off, by all the efforts the flea can uſe for that purpoſe.

(17.) ANIMALCULES, THEORIES OF GENERATION, &c. DRAWN FROM. Before the invention of microſcopes, the doctrine of equivocal generation, both with regard to animals and plants of ſome kinds, was univerſally received: but this inſtrument ſoon convinced every intelligent perſon, that thoſe plants which formerly were ſuppoſed to be produced by equivocal generation aroſe from ſeeds, and the animals, in like manner, from a male and female. But while the microſcope threw light upon one part of nature, it left another involved in darkneſs; for the origin of the animalcula infuſoria, or of the ſpermatic animals already mentioned, remains as yet as much unknown as that of many other kinds was, when the doctrine of equivocal generation reigned in full force. The diſcovery of ſpermatic animalcules was thought to throw ſome light on the myſterious affair of

generation

generation itſelf, and theſe minute creatures were imagined to be each of them individuals of the ſame ſpecies with the parent. Here the infinite number of theſe animalcules was an objection, and the difficulty remained as great as before; for, as every one of theſe animalcules behoved to be produced from a male and female, to explain their origin by animalcular generation in the ſame manner, was only explaining generation by itſelf. This hypotheſis, therefore, having proved unſatisfactory, others have been invented. Count Buffon, particularly, hath invented one, by which he at once annihilates the whole animalcular world; and in this he hath been followed by ſeveral very ingenious philoſophers. For a particular account of this, ſo far as it concerns generation, we muſt refer to that article; but as he gives ſuch a particular account of his having examined the human ſemen, that we cannot doubt of his accuracy, we ſhall here contraſt his account with that of Mr Lewenhoek already mentioned. Having procured the ſeminal veſſels of a man who died a violent death, he extracted all the liquor from them while they were ſtill warm; and having examined a drop of it with a double microſcope, it appeared as in *Pl.* XII. *fig.* 9. Large filaments appeared, which in ſome places ſpread out into branches, and in others intermingled with one another. Theſe filaments clearly appeared to be agitated by an internal undulatory motion, like hollow tubes, which contained ſome moving ſubſtance. He ſaw diſtinctly this appearance changed for that of *fig.* 10. Two of theſe filaments, which were joined longitudinally, gradually ſeparated from each other in the middle, alternately approaching and receding, like two tenſe cords fixed by the ends, and drawn aſunder in the middle. Theſe filaments were compoſed of globules that touched one another, and reſembled a chaplet of beads. After this, he obſerved the filaments ſwelled in ſeveral places, and perceived ſmall globular bodies iſſue from the ſwelled parts, which had a vibratory motion like a pendulum. Theſe ſmall bodies were attached to the filaments by ſmall threads, which gradually lengthened as the bodies moved. At laſt, the ſmall bodies detached themſelves entirely from the filaments, drawing after them the ſmall thread which looked like a tail. When a drop of the ſeminal liquor was diluted, theſe ſmall bodies moved in all directions very briſkly; and had he not ſeen them ſeparate themſelves from the filaments, he would, he ſays, have thought them to be animals. The ſeminal matter was at firſt too thick, but gradually became more fluid; and, in proportion as its fluidity increaſed, the filaments diſappeared, but the ſmall bodies became exceedingly numerous. Each of them had a long thread or tail attached to it, from which it evidently endeavoured to get free. Their progreſſive motion was extremely ſlow, during which they vibrated to the right and left, and at each vibration they had a rolling unſteady motion in a vertical direction. At the end of two or three hours, the ſeminal matter becoming ſtill more fluid, a greater number of theſe moving bodies appeared. They were then more free of incumbrances; their tails were ſhorter; their progreſſive more direct, and their horizontal motion greatly diminiſhed. In five or ſix hours, the liquor had acquired almoſt all the fluidity it could acquire, without being decompoſed. Moſt of the ſmall bodies were now diſengaged from their threads; their figure was oval. They moved forward with conſiderable quickneſs, and, by their irregular motions backward and forward, they had now more than ever the appearance of animals. Thoſe that had tails adhering to them, ſeemed to have leſs vivacity than the others; and of thoſe that had no tails, ſome altered both their figure and their ſize. In twelve hours, the liquor had depoſited at the bottom of the vial a kind of aſh coloured gelatinous ſubſtance, and the fluid at top was almoſt as tranſparent as water. The little bodies being now entirely freed from their threads, moved with great agility, and ſome of them turned round their centres. They alſo often changed their figures, from oval becoming round, and often breaking into ſmaller ones. Their activity always increaſed as their ſize diminiſhed. In 14 hours, the liquor had depoſited a greater quantity of gelatinous matter, which, being with ſome difficulty diluted in water, exhibited an appearance ſomewhat reſembling lace. In the clear ſemen itſelf only a few ſmall bodies were now ſeen moving; next day, theſe were ſtill farther diminiſhed; and after this nothing was to be ſeen but globules, without the leaſt appearance of motion. Moſt of the abovementioned appearances are ſhown *fig.* 10, 11, 12, 13, 14, 15, 16. *Fig.* 17. and 18. repreſent an appearance of the globules in another experiment, in which they arranged themſelves in troops, and paſſed very quickly over the field of the microſcope. In this experiment they were found to proceed from a ſmall quantity of gelatinous mucilage.

(18.) ANIMALCULES, THE REAL EXISTENCE OF, DENIED. From the above experiments, Buffon concludes, that what have been called ſpermatic animals, are not creatures really endued with life, but ſomething proper to compoſe a living creature; and he diſtinguiſhes them by the name of *organic particles*. The ſame individual kinds of animals he declares he has found in the fluids ſeparated from the ovaria of females; and for the truth of this appeals to the teſtimony of Mr Needham, who was an eye witneſs of his experiments. He alſo brings an additional proof of his doctrine from Mr Needham's obſervations on the milt of the *calmar*, a ſpecies of cuttle fiſh. Hence the ſpermatic animals, at leaſt what have the only appearance of life, are vaſtly larger than in any other creature, ſo as to be plainly viſible to the naked eye. When magnified, they appear as in Pl. XII. fig. 19. and 20 *a*. Their firſt appearance is at fig. 19 *a* and *b*, when they reſemble ſprings incloſed in a tranſparent caſe. Theſe ſprings were equally perfect at firſt as afterwards; only in time they contracted themſelves, and became like a kind of ſcrew. The head of the caſe is a ſpecies of valve which opens outwards, and through which every thing within may be forced out. It contains, beſides, another valve *b*, a little barrel *c*, and a ſpongy ſubſtance *d e*. Thus, the whole machine conſiſts of an out tranſparent cartilaginous caſe fig. 20. *a*, the ſuperior extremity of which is terminated by a round head formed by the

the case itself, and performs the office of a valve. This external case contains a transparent tube; which includes the spring, piston or valve, a little barrel, and a spongy substance. The screw occupies the superior part of the tube and case, the piston and barrel are situated in the middle, and the spongy substance occupies the inferior part. These machines pump the liquor of the milt; the spongy substance is full of this liquor; and, before the animal spawns, the whole milt is only a congeries of these bodies which have sucked up all the liquor of it. Whenever these small machines are taken out of the body of the animal, and put in water, or exposed to the air, they begin to act, as represented fig. 19. and 20; the spring mounts up, and is followed by the piston, the barrel, and the spungy substance which contains the liquor; and as soon as the spring and the tube in which it is contained begin to issue out of the case, the spring plaits, and the whole internal apparatus moves, till the spring, the piston, and the barrel, have entirely escaped from the case. When this is effected all the rest instantly follow, and the milty liquor which had been pumped in and confined in the spongy substance, runs out through the barrel. According to this account, the milt of the calmar contains no animacules; and therefore we may from analogy conclude, that the small moving bodies which are to be seen in the semen of other animals, are not really creatures endowed with life. Mr Buffon extends the analogy still farther; and concludes, that all the moving bodies which are to be found in the infusions either of animal or vegetable substances are of a similar nature. "To discover, says he, whether all the parts of animals, and all the seeds of plants, contained moving organic particles, I made infusions of the flesh of different animals and of the seeds of more than 20 different species of vegetables; and after remaining some days in close glasses, I had the pleasure of seeing organic moving particles in all of them. In some they appeared sooner, in others later; some preserved their motions for months, and others soon lost it. Some at first produced large moving globules resembling animals which changed their figure, split, and became gradually smaller. Others produced only small globules, whose motions were extremely rapid; and others produced filaments, which grew longer, seemed to vegetate, and then swelled and poured forth torrents of moving globules." This last observation gave rise to a new system. Baron Murchausen, perceiving that the last mentioned moving globules, after moving for some time, began again to vegetate, concluded that they were first animals and then *plants!*—This strange hypothesis Mr Ellis has overturned in the paper already quoted; in which he asserts that they are no other than the seeds of that genus of fungi called *mucor* or *mouldiness*, and that their motion is owing to numbers of minute animalcules attacking them for food. "Having (says he,) at the request of Dr Linnæus, made several experiments on the infusion of mushrooms in water in order to prove the theory of Baron Munchausen, that their seeds are first animals, and then plants (which he takes notice of in his System of Nature, p. 1326, under the genus of chaos, by the name of *chaos fungorum seminum*), it appeared evidently, that the seeds were put into motion by very minute animalcules, which proceeded from the putrefaction of the mushrooms: for by pecking at these seeds, which are reddish, light, round bodies, they moved them about with great agility in a variety of directions; while the little animals themselves were scarce visible, till the food they had eaten discovered them. The satisfaction I received from clearing up this point, led me into many other curious interesting experiments. The ingenious Mr Needham supposes these little transparent ramified filaments, and jointed or coralloid bodies, which the microscope discovers to us on the surface of most animal and vegetable infusions when they become putrid, to be zoophytes, or branched animals: but to me they appear, after a careful scrutiny with the best glasses, to be of that genus of fungi called *mucor* or *mouldiness*; many of which Michelius has figured, and Linnæus has accurately described. Their vegetation is so amazingly quick, that they may be perceived in the microscope even to grow and feed under the eye of the observer. Mr Needham has pointed out to us a species that is very remarkable for its parts of fructification. This, he says, proceeded from an infusion of bruised wheat. I have seen the same species arise from the body of a dead fly, which was become putrid by lying floating for some time in a glass of water, where some flowers had been in the month of August 1768. This species of mucor sends forth a mass of transparent filamentous roots; from whence arise hollow stems, that support little oblong oval seed vessels, with a hole on the top of each. From these I could plainly see minute globular seeds issue forth in great abundance with an elastic force, and turn about in the water as if they were animated. Continuing to view them with some attention, I could just discover, that the putrid water which surrounded them was full of the minutest animalcula; and that these little creatures began to attack the seeds of the mucor for food, as I have observed before in the experiment on the seeds of the larger kind of fungi or mushrooms. This new motion continued the appearance of their being alive for some time longer; but, soon after, many of them arose to the surface of the water, remaining there without motion; and a succession of them afterwards coming up, they united together in little thin masses, and floated to the edge of the water, remaining there quite inactive during the time of observation. As this discovery cleared up many doubts which I had received from reading Mr Needham's learned dissertation, I put into the glass several other dead flies, by which means this species of mucor was propagated so plentifully, as to give me an opportunity of frequently trying the same experiment to my full satisfaction. Lastly, These jointed coralloid bodies, which Mr Needham calls *chaplets* and *pearl necklaces*, I have seen frequently very distinctly. These appear not only on an infusion of bruised wheat when it becomes putrid, but on most other bodies when they throw up a viscid scum, and are in a state of putrefaction. These, then, are evidently no more than the most

common mucor, the ſeeds of which are every where floating in the air; and bodies in this ſtate afford them a natural proper ſoil to grow upon. Here they ſend downwards their fine tranſparent ramified roots into the moiſture which they float upon; and from the upper part of the ſcum, their jointed coralloid branches riſe full of ſeed into little grove like figures. When a ſmall portion of theſe branches and ſeeds are put into a drop of the ſame putrid water upon which the ſcum floats, many of theſe millions of little animalcula with which it abounds, immediately ſeize them as food, and turn them about with a variety of motions, as in the experiments on the ſeeds of the common muſhrooms, either ſingly, or two or three ſides connected together; anſwering exactly to Mr Needham's deſcription, but evidently without any motion of their own, and conſequently not animated." The Count de Buffon, however, is not content with denying life only to thoſe beings where the ſigns of it are the moſt equivocal; but includes in the ſame rank of organic particles, almoſt every animal too ſmall to be diſcovered by the naked eye, and even ſome of thoſe whoſe motions are evidently perceptible to the eye. "Almoſt all microſcopic animals," ſays he, "are of the ſame nature with the moving bodies in the ſeminal fluids and infuſions of animal and vegetable ſubſtances. The eels in paſte, in vinegar, &c. are all of the ſame nature, and derived from the ſame origin. There are, perhaps, as many beings that either live or vegetate, produced by a fortuitous aſſemblage of organic particles, as by a conſtant and ſucceſſive generation. Some of them, as thoſe of the calmar, are only a kind of machines, which, though exceedingly ſimple, are very active. Others, the ſpermatic animalcules, ſeem to intimate the movements of animals. Others reſemble vegetables in their manner of growth and extenſion. There are others, as thoſe of blighted wheat, which at pleaſure can be made alternately either to live or die, and it is difficult to know to what they ſhould be compared. There are ſtill others, and in great numbers, which are at firſt a kind of animals, then become a ſpecies of vegetables, and again return alternately to their vegetable ſtate. The eels in paſte have no other origin than the union of the organic particles of the eſſential part of the grain. The firſt eels that appear are certainly not produced by other eels; but though they are not propagated themſelves, they fail not to engender other living eels. By cutting them with the point of a lancet, we diſcover ſmaller eels iſſuing in great numbers out of their bodies. The body of this animal ſeems to be only a ſheath or ſac, containing a multitude of ſmaller animals, which perhaps are other ſheaths of the ſame kind, in which the organic matter is aſſimilated into the form of eels."

(19.) ANIMALCULES, THE REASONING AGAINST THE EXISTENCE OF, INCONCLUSIVE.—Though we can by no means pretend to account for the appearance of theſe animalcules, yet we cannot help obſerving, that our ignorance of the cauſe of any phenomenon is no argument againſt its exiſtence. Though we are not able to account in a ſatisfactory manner, for the origin of the native Americans, we ſuppoſe Buffon himſelf would reckon it abſurd to maintain, that the Spaniards, on their arrival there, found only *organic particles* moving about in diſorder. The caſe is the ſame with the eels in paſte. They are exceedingly minute, in compariſon with us; but, with the ſolar microſcope, Mr Baker has made them aſſume a more reſpectable appearance, ſo as to have a diameter of an inch and an half, or two inches, and a length proportionable. They ſwarm up and down, very briſkly: the motion of their inteſtines was plainly viſible; when the water dried up, they died with apparent agonies, and their mouths gaped very wide. Were we to find a creature of the ſize of this magnified eel, gaſping in a place where water had lately been, we certainly would never conclude it to be an *organic particle*, or a fortuitous aſſemblage of them, but a fiſh. Why then ſhould we conclude otherwiſe, with regard to the eel, while in its natural ſtate, than that it is a little fiſh? In reaſoning on this ſubject, we ought always to remember, that, however eſſential the diſtinction of bodies into great and ſmall, may appear to us, they are not ſo to the Deity; with whom, as Mr Baker well expreſſes himſelf, "an atom is as a world, and a world but as an atom." Were the Deity to exert his power for a little, and give a natural philoſopher a view of a quantity of paſte, filled with eels, from each of whoſe bodies the light was reflected, as when it paſſes through a ſolar microſcope; inſtead of imagining them organic particles, the paſte would appear like a little mountain, he would probably look upon the whole, as a monſtrous aſſemblage of ſerpents, and be afraid to come near them. Wherever, therefore, we diſcover beings, to appearance endued with the principle of ſelf preſervation, or whatever elſe we make the characteriſtic of animals, neither the ſmallneſs of their ſize, nor the impoſſibility of our knowing how they come there, ought to cauſe us doubt of their being really animated.—At the ſame time, it muſt alſo be remembered that *motion* is not always a characteriſtic of animal life, even though the moving bodies ſhould avoid one another, or any ſeeming obſtacle placed in their way. We know, that inanimate bodies when electrified, will avoid others, endowed with an electricity of the ſame kind, and adhere to thoſe which have the oppoſite one. As we are by no means acquainted with the utmoſt power of electricity, but on the contrary, from what we do know of it, have all the reaſon in the world, to conclude, that it can produce effects utterly beyond our comprehenſion, it is impoſſible for us to know what ſhare it may have in producing the motions obſerved in vegetable infuſions, or in the ſemen of animals. We may alſo further obſerve, that though in Mr Ellis's experiment of the boiled potatoe, he took it for granted, that every ſeed of animal life would be deſtroyed by the boiling water, yet even this cannot be proved; nay, on the contrary, it hath been proved, by undeniable experiments, that the human body itſelf hath endured a heat of 22[illegible] degrees of Fahrenheit, (28 degrees above that of boiling water) without injury. The eggs of theſe animalcula might therefore be ſtrong enough to

to reſiſt the heat hitherto uſed in Mr Elis's or any other experiment. A conſiderable objection to the exiſtence of animalcules in the ſemen, or any other part of animal bodies, ariſes from the total excluſion of air, which is found ſo neceſſary to the life of larger animals. Some inſtances, however, have been obſerved of toads, ſhell fiſh, and other large animals being found in ſuch ſituations, as they could not poſſibly have enjoyed the leaſt benefit from the air, for a great number of years; and yet, in this ſtate, they have not only lived, but lived much longer than they would otherwiſe have done. See BUFO, and DACTYLUS. Upon the whole, therefore, though philoſophers are not yet able to diſcover how theſe minute creatures are produced; yet, that there really are animals much ſmaller than what we can diſcern with our naked eye, ſeems to be indiſputable. The ſubject, however, is ſtill evidently obſcure, and will no doubt require the utmoſt attention of philoſophers, as well as further improvements in the conſtruction of microſcopes, fully to inveſtigate it.

(20.) ANIMALCULES, VARIOUS DISEASES OCCASIONED BY. Animalcules are ſaid to be the cauſe of various diſorders. The itch, from ſeveral experiments, is found to be a diſorder ariſing from the irritations of a ſpecies of animalcula, in the puſtules of that ailment: whence the communication of it by contact, is eaſily conceived, as alſo the reaſon of the cure being effected by cutaneous applications. On this foundation, ſome have attributed the ſmall pox, and meaſles, and infectious diſeaſes; others the epilepſy, &c. to animalcules. Langius goes farther, and pretends to reduce all diſeaſes in general, to the ſame principle. A late writer in the *Journal des Scavans*, (tom. lxxxii.) at Paris, who aſſumed the title of an Engliſh phyſician, has done more. He not only accounts for all diſeaſes, but for the operations of all medicines, from the hypotheſis of animalcules! He has peculiar animals for every diſeaſe; ſcorbutic animalcules, podagrical animalcules, variolous animalcules, &c. all at his ſervice. But, as moſt diſcoveries in natural philoſophy, have laid a foundation, for the warm imaginations of ſome men, to form viſionary theories, to the great prejudice of real knowledge: ſo thoſe relating to animulcula, have been drawn in, however improperly, to ſupport the moſt whimſical and chimerical ſyſtems.

(21.) ANIMALCULES, VARIOUS, STILL INVISIBLE. Naturaliſts ſuppoſe other ſpecies or orders of invifible animalcules, viz. ſuch as eſcape the cognizance, even of the beſt microſcopes, and give many probable conjectures in relation to them. Reaſon and analogy give ſome ſupport to the exiſtence of infinite imperceptible animalcules. The naked eye takes in from the elephant to the mite; but *there* commences a new order, reſerved only for the microſcope, which comprehends all theſe from the mite to thoſe 27 millions of times ſmaller: and this order cannot be yet ſaid to be exhauſted, if the microſcope be not arrived at its laſt perfection. See MICROSCOPE.—Every animalcule being an organized body, how delicate and ſubtle muſt the parts be, that are neceſſary to conſtitute it, and to preſerve its vital actions! It is hard to conceive, how, in ſo narrow a compaſs, there ſhould be contained a heart to be the fountain of life, muſcles neceſſary to its motions, glands for the ſecretion of its fluids, ſtomach and bowels to digeſt its food, and other innumerable members, without which an animalcule cannot ſubſiſt. But ſince every one of theſe members is alſo an organical body, they muſt likewiſe have parts neceſſary to their actions.—For they conſiſt of fibres, membranes, coats, veins, arteries, nerves, and an almoſt infinite number of fine tubes, like thoſe, whoſe ſmallneſs ſeems to exceed all efforts of imagination. But there are ſome parts that ought always to be infinitely leſs than theſe, as the fluids that flow along theſe fine tubes, the blood, lymph, and animal ſpirits, whoſe ſubtility, even in large animals, is incredible. Leuwenhoek calculates that a thouſand millions of animalcula, which are diſcovered in common water, are not altogether ſo large as a common grain of ſand. In the milt of a ſingle cod fiſh, there are more animals than there are men upon the whole earth; and yet a grain of ſand is bigger than four millions of them!

* ANIMALITY. *n. ſ.* [from *animal*.] The ſtate of animal exiſtence.—The word animal firſt only ſignifies human *animality*. In the minor propoſition, the word animal, for the ſame reaſon, ſignifies the *animality* of a gooſe: thereby it becomes an ambiguous term, and unfit to build the concluſion upon. *Watts*.

* ANIMATE. *adj.* [from *To animate*.] Alive; poſſeſſing animal life.—All bodies have ſpirits and pneumatical parts within them; but the main differences between *animate* and inanimate, are two: the firſt is, that the ſpirit of things *animate* are all contained within themſelves and are branched into veins and ſecret canals, as blood is: and, in living creatures, the ſpirits have not only branches, but certain cells or ſeats, where the principal ſpirits do reſide, and whereunto the reſt do reſort: but the ſpirits in things inanimate are ſhut in, and cut off by the tangible parts, and are not pervious one to another, as air is in ſnow. *Bacon*.

* *To* ANIMATE. *v. a.* [*anima*, Lat.] 1. To quicken; to make alive; to give life to: as, the ſoul *animates* the body; man muſt have been *animated* by a higher power. 2. To give powers to; to heighten the powers, or effect of any thing.—

But none, ah! none can *animate* the lyre,
And the mute ſtrings with vocal ſouls inſpire;
Whether the learn'd Minerva be her theme,
Or chaſte Diana bathing in the ſtream;
None can record their heav'nly praiſe ſo well
As Helen, in whoſe eyes ten thouſand Cupids dwell. *Dryden*.

3. To encourage; to incite.—The more to *animate* the people, he ſtood on high, from whence he might beſt be heard, and cried unto them with a loud voice. *Knolles*.

(1.) * ANIMATED. *participal adj.* [from *animate*.] Lively; vigorous.—

Warriours ſhe fires with *animated* ſounds;
Pours balm into the bleeding lover's wounds. *Pope*.

(2.) ANIMATED, alſo denotes a thing impregna-

ted with vermin or animalcules. In this ſenſe, the whole earth ſeems to be animated; for, in every part of it, we meet with an infinite number of animals, either viſible or inviſible; they are found in air, water, earth, plants, and even in the hardeſt ſtones; and there is perhaps no animal known, which does not breed numbers of others, in the different parts of its body.

ANIMATED HORSE HAIRS. See HORSE HAIRS.

ANIMATED MERCURY, among chemiſts, quickſilver, impregnated with ſome ſubtle and ſpiritous particles, ſo as to render it capable of growing hot, when mingled with gold.

ANIMATED NEEDLE, a needle touched with the load ſtone.

* ANIMATENESS. *n. ſ.* [from *animate*.] The ſtate of being animated. *Dict.*

(1.) * ANIMATION. *n. ſ.* [from *animate*.] 1. The act of animating or enlivening.—Plants or vegetables are the principal part of the third day's work. They are the firſt *producat*, which is the word of *animation*. *Bacon*. 2. The ſtate of being enlivened.—Two general motions in all *animation* are its beginning and encreaſe; and two more to run through its ſtate and declination. *Brown's Vulgar Errours*.

(2.) ANIMATION has been more accurately defined the informing an animal body with a ſoul. —The different hypotheſes of phyſicians and philoſophers, concerning the time of animation, have had their influence on the penal laws made againſt artificial abortions; it having been made capital to procure miſcarriage in the one ſtate, while in the other it was only deemed a venial crime. Charles V. by a conſtitution publiſhed in 1532, put the matter on another footing; inſtead of the diſtinction of an animated and unanimated fœtus, he introduced that of a vital and non-vital fœtus, as a thing of more obvious and eaſy deciſion, and not depending on any ſyſtem either of creation, traduction, or infuſion. Accordingly a fœtus is ſaid, in a legal ſenſe, to be animated, when it is perceived to ſtir in the womb; which uſually happens about the middle of the term of gellation, although it often happens earlier.

(3.) ANIMATION, in alchemy, is the operation of fermenting a white foliated earth, with a kind of philoſophical or celeſtial water or ſulphur. It is alſo uſed by hermetic philoſophers, to denote a certain ſtate of perfection to which a body is brought by ſome appropriate proceſs, in virtue whereof it becomes capable of producing ſome extraordinary phenomena.

(4.) ANIMATION, in rhetoric, the act of giving life and force to a diſcourſe.

* ANIMATIVE. *adj.* [from *animate*.] That which has the power of giving life, or animating.

ANIMATO, in muſic. See ANIMA, N° 3.

* ANIMATOR. *n. ſ.* [from *animate*.] That which gives life; or any thing analogous to life, as motion.—Thoſe bodies being of a congenerous nature, do readily receive the impreſſions of their motor, and, if not fettered by their gravity, conform themſelves to ſituations, wherein they beſt unite to their *animator*. *Brown*.

(1.) ANIME, a reſin exſuding from an inciſion of the trunk of a large American tree, called by Piſo *jetaiba*, by the Indians *courbaril*, a ſpecies of HYMENÆA. This reſin is of a tranſparent amber colour, a light agreeable ſmell, and little or no taſte. It diſſolves entirely, but not very readily in rectified ſpirit of wine; the impurities, which are often in large quantity, remaining behind. The Brazilians are ſaid to employ anime in fumigations for pains and aches proceeding from a cold cauſe; with us, it is rarely, if ever, made uſe of for any medicinal purpoſes. There are two ſpecies of it, viz.

1. ANIME, EASTERN, is diſtinguiſhed into three kinds; the firſt is white: the ſecond blackiſh, in ſmell like myrrh; the third pale, reſinous, and dry.

2. ANIME, WESTERN, flows from an inciſion of a tree in New Spain, called *courbaril*; it is tranſparent, and of a colour like that of frankincenſe; its ſmell is very agreeable, and it eaſily conſumes in the fire.

(1.) ANIME, in heraldry, a French term uſed when the eyes of a rapacious creature are born of a different tincture from the creature itſelf. The Engliſh name is *incenſed*.

ANIMELLÆ, the glands under the ears, &c. called alſo *loticinia*.

ANIMETTA, in eccleſiaſtical writers, the cloth, wherewith the cup is covered in the euchariſt.

ANIMI DELIQUIUM, ſwooning. See LYPOTHYMIA.

ANIMODAR, in aſtrology, the method of rectifying nativities.

* ANIMOSE. *adj.* [*animoſitas*, Lat.] Full of ſpirit; hot; vehement. *Dict.*

* ANIMOSENESS. *n. ſ.* [from *animoſe*.] Spirit; heat, vehemence of temper. *Dict.*

* ANIMOSITY. *n. ſ.* [*animoſitas*, Lat.] Vehemence of hatred; paſſionate malignity. It implies rather the diſpoſition to break out into outrages, than the outrage itſelf.—They were ſure to bring paſſion, *animoſity*, and malice enough of their own, what evidence ſoever they had from others. *Clarendon*.—If there is not ſome method found out for allaying theſe heats and *animoſities* among the fair ſex, one does not know to what outrages they may proceed. *Addiſon*.—No religious ſect ever carried their averſion for each other to greater heights than our ſtate parties have done; who, the more to inflame their paſſions, have mixed religious and civil *animoſities* together borrowing one of their appellations from the church. *Swift*.

ANIMUS, the mind, as expreſſing the rational faculty, in diſtinction from ANIMA, the ſoul, where that faculty reſides.

ANIMUS INJURIANDI, in the criminal law of Scotland, the intention of injuring another, without which, the act, in peculiar circumſtances, is not ſufficient to conſtitute criminality.

ANINGA, in commerce, a root growing in the Caribbee iſlands, reſembling the China plant, uſed in the refinement of ſugar. The decoction of this root is a more certain, as well as more ſafe means of clarifying ſugar, than ſublimate and arſenic, which were uſed for this purpoſe, before the diſcovery of the aninga.

ANIO, or ANIEN, in ancient geography, now *il Teverone:* a river of Italy, which falls into the Tiber, 3 miles to the N. of Rome, not far from Antemnæ. It riſes in a mountain near Treba, and running through the country of Æqui, it afterwards ſeparated the Latins from the Sabines; but nearer its mouth, or confluence, it had the Sabines on each ſide. It forms three beautiful lakes in its courſe. In the territories of Tibur it falls from a great height, and there forms a very rapid cataract: hence the epithet *præceps Anienus*, and hence the ſtream cauſed by its fall.

ANJOU, a ci-devant province of France, which, in conjunction with the late provinces of Maine and Touraine, now forms the four departments of Maine Sarte, Maine and Loire and Indre and Loire. It was bounded by Touraine, Poictou, Bretagne, and Maine; and extended 70 miles in length, and in breadth 60. Through it run five navigable rivers: the Loire, which divides it into two parts; the Vienne, the Toue, the Maienne, and the Sarte. The air is temperate, and the country agreeably diverſified with hills and meadows. There are 33 foreſts of oak trees mixed with beech. It produces white wine, wheat, barley, rye, oats, peaſe, beans, flax, hemp, walnuts, cheſnuts, cyder, and fruit trees of all kinds, and paſture proper for horſes. Its greateſt riches conſiſt in cows, oxen, and ſheep. There are ſeveral coal and iron mines; quarries of marble and of ſlate; as well as of white ſtone, proper for building, on the ſide of the Loire. It has alſo ſeveral ſaltpetre works and ſome glaſs houſes. The remarkable towns, beſides Angers the capital, are Saumur, Briſac, Pons de Cea, La Fleche, and Beaufort.

ANISATA AQUA, aniſe-ſeed water. See ANISE-SEED, § 3.

ANISATUM SACCHARUM, ſugar of aniſe. It is a good carminative for children, when troubled with flatulence, gripes, &c.

ANISCALPTOR, in anatomy, a muſcle, otherwiſe called *latiſſimus dorſi*.

(1.) * ANISE. *n. ſ.* [*aniſum*, Lat.] A ſpecies of apium or parſley, with large ſweet ſcented ſeeds. —This plant is not worth propagating in England for uſe, becauſe the ſeeds can be had much better and cheaper from Italy. *Miller.*—Ye pay tythe of mint, and *anife*, and cummin, and have omitted the weightier matters of the law, judgement, mercy, and faith: theſe ought ye to have done, and not to leave the other undone. *Matt.* xxiii. 23.

(2.) ANISE-SEED, a medicinal ſeed, produced by the plant aniſe, and containing an eſſential oil. It is carminative, expelling wind out of the ſtomach and bowels, both given at the mouth, and in clyſters. It is uſeful againſt cold affections of the lungs, difficulty of breathing, and aſthma. Some recommend it to be taken frequently by nurſes to increaſe their milk. It is often uſed as a corrector of the ſtronger purgatives. The oil diſtilled from the ſeed is uſed for the ſame purpoſes; and is often applied outwardly in carminative and anodyne liniments; particularly for the pleuriſy, and other pains in the ſide. See § 1.

(3.) ANISE-SEED, STARRY, *aniſum ſtellatum*, is a ſeed brought chiefly from Tartary; thus called from the affinity it bears in ſmell to the common aniſe-ſeed, and the ſtar like figure of its *capſula ſeminalis*. It was brought into Europe from the Philippine iſlands by an Engliſh mariner, named Thomas Candy, in his return from a voyage round the world in 1601.—The natives call it *damor* and *zingi;* the Europeans *foeniculum Sinenſe* or Chineſe fennel. Its virtues are the ſame with thoſe of the common aniſe-ſeed, only that it is ſweeter and more grateful. It is reputed a general cordial and ſtrengthener. The Dutch and the Chineſe uſe it in the preparation of their tea. In diſtilling the aniſe-ſeed for the oil, there is procured a limpid water, called aniſe-ſeed water; which has much the ſame virtues with the oil.

ANISUM, aniſe. See ANISE, § 1, 2, 3, and PIMPINELLA.

(1.) * ANKER. *n. ſ.* [*ancker*, Dut.] A liquid meaſure chiefly uſed at Amſterdam. It is the fourth part of the awm, and contains two ſtekans: each ſtekan conſiſts of ſixteen mengles; the mengle being equal to two of our wine quarts. *Chamb.*

(2.) ANKER, in Engliſh meaſure, contains about 32 gallons.

(3.) ANKER, in geography, a river in Warwickſhire, which falls into the Tame, at Tamworth.

ANKERDEN, a village in Worceſterſhire, on the borders of Herefordſhire.

ANKERTON, a ſmall town in Oxfordſhire, NW. of Banbury.

ANKERWICK, a village in Buckinghamſhire, on the Thames.

ANKHAM, a river of Lincolnſhire, which falls into the Humber.

(1.) * ANKLE. [*ancleow*, Sax. *anckel*, Dutch.] The joint which joins the foot to the leg.—One of his *ankles* was much ſwelled and ulcerated on the inſide, in ſeveral places. *Wiſeman.*

(2.) * ANKLE-BONE. *n. ſ.* [from *ankle* and *bone.*] The bone of the ankle.—The ſhin bone, from the knee to the inſtep, is made by ſhadowing one half of the leg with a ſingle ſhadow, the *ankle-bone* will ſhew itſelf by a ſhadow given underneath, as the knee. *Peacham.*

(3.) ANKLE, LUXATIONS, &c. OF THE. The ankle is ſubjected to be luxated, either in running, in jumping, or even in walking; and that in all four directions, either inward or outward, backward or forward. When the ankle is luxated inward, the bottom of the foot is turned outward; and, on the contrary, when it is luxated outward, the bottom of the foot is turned inward, which latter caſe is indeed much more frequent than the others. If it is diſlocated forward, the heel becomes ſhorter, and the foot longer than it ſhould be: and if backward, the contrary ſigns to theſe will appear. The ankle, however, can ſcarce poſſibly be luxated outwards, unleſs the *fibula* be ſeparated from the *tibia*, or elſe quite broken, which may happen to the external ankle to be attended with very grievous ſymptoms, eſpecially when occaſioned by ſome great external violence. Nor can it indeed well happen otherwiſe in this caſe, ſince the diſtortion of the foot muſt neceſſarily overſtrain the adjacent tendons, ligaments, and nerves, and thence excite very violent pains, and other bad ſymptoms: or the veins and arteries may alſo be very eaſily lacerated, which will occaſion

occaſion a large extravaſation of blood about the whole foot, and too often give riſe to a gangrene. It is however neceſſary to obſerve, that the ankle is not always luxated, after it has been violently ſtrained by leaping, or turning the foot on one ſide; for it ſometimes happens that the ankle is not diſlocated on theſe occaſions, but only the parts violently contuſed and ſtrained. The ankle, when truly luxated, is more or leſs difficult to be reduced, according to the violence of the force by which the accident was occaſioned. The moſt ready way, however, of reducing a luxation of the ankle, is to place the patient upon a bed, ſeat, or table, letting the leg and foot be extended in oppoſite directions by two aſſiſtants, while the ſurgeon replaces the bones with his hands and fingers in their proper ſituation. When the foot is by this means reſtored to its proper poſition, it is to be well bathed with oxycrate and ſalt, and then carefully bound up with a proper bandage. The patient muſt be enjoined to keep his bed for a conſiderable time, till the bad ſymptoms are gone, and the ankle has recovered its ſtrength ſo far as to bear the weight of the body, without any uneaſineſs or danger. We have an account of the *menſes* regularly evacuated at an ulcer of the ankle, in the Edinburgh Medical Eſſays, vol. iii. art. 29.

ANKRED, in heraldry. See ANCRED.

ANLABY, a village in Yorkſhire, near Hull.

ANLACE, a falchion, or ſword ſhaped like a ſcythe.

ANN, or ANNAT, in Scots law, is half a year's ſtipend, which the law gives to the executors of miniſters of the church of Scotland, over and above what was due to the miniſter himſelf, for his incumbency.

(1.) ANNA, [of חנה, Heb gracious,] a Jewiſh propheteſs, the daughter of Phanuel, of the tribe of Aſher. She had been early married, and had lived ſeven years with an huſband. After his death, ſhe devoted herſelf to the ſervice of God; and it was while thus employed, that, finding the virgin Mary, with her infant Son, in the temple, ſhe joined with the venerable Simeon, in thanking God for him, and in bearing teſtimony to him, as the promiſed Meſſiah. It is worth remarking that theſe two early teſtifier's of our Saviour's miſſion, being both far advanced in life, could not be liable to the moſt diſtant ſuſpicion of collufion with Joſeph and Mary in palming a falſe Meſſiah on their countrymen; as they had not the ſmalleſt probable chance of living to ſee him grow up to maturity, and fulfil their prophecies, and therefore could have no intereſt in declaring a falſehood.

(2.) ANNA, a province of Arabia Deſerta, and one of the 3 principalities into which it is divided.

(3.) ANNA, one of the chief cities of the above principality, and formerly a famed market town ſituated on the W. bank of the Euphrates, in a fruitful and pleaſant ſoil, 130 miles W. of Bagdad, and 120 SSW. of Mouſſol. It has two ſtreets, which are divided by the river. That on the Meſopotamia ſide is about two miles long, but thinly peopled, and by none but tradeſmen; that on the oppoſite ſide is about ſix miles in length, and it is there that the principal inhabitants dwell. Every houſe has ſome ground belonging to it; and theſe grounds are loaded with fruit trees, bearing lemons, oranges, citrons, quinces, figs, dates, pomgranates, olives, &c. all very large and in great plenty. Some of the flat grounds are ſown with corn and other grain, which yield likewiſe conſiderable crops. This city is the common rendezvous of all the robbers that infeſt the country, and from which they diſperſe themſelves into all parts of the Deſart. Here they meet to hold their grand councils, and deliberate where to rob next with ſucceſs. It is with great difficulty that the Turkiſh aga, and the janiſſaries who are kept here, can levy the tribute impoſed by the Turks on all the commodities carried through this city, which is one of the great thoroughfares for the paſſage of the caravans to and from Aleppo, Tripoli, Damaſcus, Bagdad, and ſome other parts of the Turkiſh empire. Lon. 41. 35. E. Lat. 33. 30. N.

(4.) ANNA, the daughter of Belus, king of Tyre, and ſiſter of Dido, whom ſhe accompanied in her flight. She was worſhipped, as a goddeſs, by the ancient Romans, under the title of *Anna Perenna*; and ſacrifices were offered to her both publicly and privately, *ut populo annare & perennare liceret.*

(5.) ANNA, the mother of the virgin Mary.

(6.) ANNA COMNENA. See COMNENA.

(7.) ANNA, or ANNE IVANOVNA, empreſs of Ruſſia, was the daughter of the czar Ivan Alexiovitch, and was born in 1693. She married Frederick William, duke of Courland, in 1710; but this connection was of ſhort duration, for he died the following year, and left no iſſue. She was not long a widow, however, when ſhe formed an intimacy with, and took into favour, Erneſt John Biren, a man of a low family. This man, whom ſhe afterwards raiſed to the duchy of Courland, at the expence of juſtice, and not without many cruel executions, ruled her in the moſt arbitrary manner as long as ſhe lived. On the death of Peter II. the laſt of the male iſſue of Peter the Great, in 1740, ſhe ſucceeded to the throne of Ruſſia, though with ſome limitations of her authority. But theſe ſhe afterwards found means to ſhake off, as well as to puniſh the Dolgoruki family, who had impoſed them. She was herſelf naturally meek and merciful, and her reign was in ſome reſpects proſperous; but ſhe was compelled to many acts, which were highly repugnant to her inclination, by a wretch to whom ſhe had yielded up her affection. And doubtleſs, it was through his influence, that not leſs than twenty thouſand perſons were baniſhed to Siberia. She died in 1740, aged 47, and left her crown to her grand nephew Ivan, under the guardianſhip of Biren, as he was then only two years of age.

(8.) ANNA, ST, a Ruſſian fortreſs, ſituated on the Don, in a marſhy country. It is well built, and the ſtreets are broad and ſtraight.

ANNABERG, a town in Saxony, famous for its warm baths. Its ſilver mines were formerly very productive. Lon. 13. 6. E. Lat. 53. 33. N.

ANNABON. See ANNABON.

ANNACLOY, a ſmall town of Ireland, in the county of Down, and province of Ulſter, ſeated on a branch of Strangford Lake.

ANNACOTTY,

ANNACOTTY, a village of Ireland, in the county of Limerick, 19 miles from Dublin.

ANNADORN, 1. a river of Ireland, in the county of Down, which falls into the inner bay of Dundrum: 2. a village, feated on the fource of the river.

ANNÆUS, the firname of an equeſtrian family of ancient Rome, rendered illuſtrious by producing the two Senecas. See SENECA, N° 1 and 2.

ANNAGH, a village of Ireland, in the county of Corke, near Charleville, in which a conſiderable linen manufacture is carried on.

ANNALE, in the Church of Rome, a term applied to the maſſes celebrated for the dead during a whole year.

ANNALES, in writers of the middle age, denote yearlings, or young cattle of a year old, or under two. Alſo a yearly rent, or annual revenue.

ANNALES BACULI, a kind of wooden almanacks uſed among our anceſtors, called alſo runſtocks. See ALMANACKS.

ANNALES LIBRI, in the civil law, books wherein the acts of a whole year were contained, in diſtinction from *ſemeſtres libri*, wherein the acts of ſix months were contained.

ANNALIFFEY, a river of Ireland, in the province of Leinſter, which riſes in the county of Wicklow, and by a circuitous courſe, runs into the county of Kildare; thence paſſes through the Leinſter aqueduct, under the great canal.

ANNALIS ACTIO, in the civil law, denotes an action which may be put in practice any time within the year. In the like ſenſe we meet with *annale decretum*, *annalis reſciſſio*, &c.

ANNALIS CLAVUS, the nail which the prætor, conſul, or dictator, drove into the wall of Jupiter's temple annually upon the Ides of September, to ſhow the number of years. This cuſtom was changed upon reckoning years by conſulſhips. The ceremony was ſometimes performed to avert the plague, &c.

ANNALIS EXCEPTIO, a kind of iniquitous privilege, anciently granted the people of Italy, that whoever had made a contract could not be compelled to the performance, or payment of what had been agreed on, within the year. Some extended this privilege ſo as to render it ſtill more grievous, by computing the year excluſive of all holidays!

* ANNALIST. *n. ſ.* [from *annals*.] A writer of annals.—Their own *annaliſt* has given the ſame title to that of *Syrmium*. *Atterbury*.

(1.) * ANNALS. *n. ſ. without ſingular number*, [*annales*, Lat.] Hiſtories digeſted in the exact order of time; narratives in which every event is recorded under its proper year.—

Could you with patience hear, or I relate,
O nymph! the tedious *annals* of our fate!
Through ſuch a train of woes if I ſhould run,
The day wou'd ſooner than the tale be done.
Dryden.

—We are aſſured, by many glorious examples in the *annals* of our religion, that every one in the like circumſtances of diſtreſs, will not act and argue thus; but thus will every one be tempted to act. *Rogers*.

(2.) ANNALS, DISTINCTION OF, FROM HISTORY. The difference between annals and hiſtory is variouſly aſſigned by various authors. Some ſay that hiſtory is properly a recital of things which the author has ſeen, alluding to the etymology of the word: hiſtory, in the Greek, ſignifying the knowledge of the things preſent, for *ἱστεω* properly ſignifies *to ſee*. On the contrary, annals, (ſay they) relate to the tranſactions of others, and ſuch as the writer never ſaw. Of this opinion the great annaliſt, Tacitus himſelf, ſeems to have been; becauſe the firſt part of his work, which treats of former times, he calls annals; but when he comes down to his own times, he changes its title, and calls it hiſtory. Aſellio, however, and the moderns in general, entertain the very oppoſite idea; and reſtrict annals to a bare relation of what paſſes each year; whereas hiſtory relates not only the tranſactions themſelves, but alſo the cauſes, motives, and ſprings of them. The annaliſt merely ſtates his facts, but the hiſtorian reaſons and deſcants on them. Annals require brevity; hiſtory demands ornament. Of this laſt opinion ſeems Cicero to be, when he ſtiles annaliſts, *non exornatores rerum, ſed tantum narratores*. He adds, that hiſtory in its original was the compoſition of annals.

(3.) ANNALS, ORIGIN OF. Cicero thus relates the origin of annals.—To preſerve the memory of tranſactions, the *pontifex maximus* wrote what paſſed each year, and expoſed it on a table in his own houſe, where every one was at liberty to read it.—This they called *annales maximi*; and this cuſtom was kept up till the year of Rome 620. Theſe annales maximi conſiſted of 80 books. They were moſt of them deſtroyed in the burning of the city by the Gauls. Similar annals were kept from the earlieſt ages by the Egyptians, Babylonians, Perſians, Chaldeans, &c. Authors, in imitation of theſe, adopted this ſimple and naked way of relating facts: and were hence denominated annaliſts.—Such were Cato, Piſtor, Piſo, Antipater, &c.

ANNAMABOE. See ANAMABOA.

ANNAMOOKA, one of the Friendly Iſlands, in the South Sea. It was diſcovered by Taſman, in 1643; and viſited by Captain Cook in 1774 and 1777. It is well cultivated in many places. The plantations of yams and plantains are very extenſive, and often incloſed with neat fences of reeds. The bread fruit and cocoa trees are interſperſed with little order, but generally near the habitations of the natives; and the other parts of the iſland, eſpecially towards the ſea, are covered with trees and buſhes of a luxuriant growth. The inhabitants are a friendly and hoſpitable people, but ſomewhat addicted to pilfering from their European viſitors. Lon. about 187. 0. E. Lat. 20. 0. S.

(1.) ANNAN, a river of Scotland, which riſes about 4 miles N. of Moffat, in that remarkable hill which alſo gives riſe to the Tweed, the Clyde, and the Evan. Mr Brown, miniſter of Moffat, in the account of his pariſh, remarks, "that though the Tweed falls into the German ocean at Berwick, the Clyde into the weſtern ſea beyond Glaſgow, and the Evan and Annan united fall into the Solway Firth, yet their ſources are ſo near each other, that one rivulet, which was formerly a branch

branch of the Clyde, now falls into the Evan." The Annan is afterwards joined by the Moffat, the Milk, and ſeveral other rivulets, and falls into the Solway Frith about 6 miles from Hoddam. It abounds with ſalmon, from 30 to 40 lb. weight, trouts, eels, roaches, parrs, &c. and a peculiar ſpecies of ſpotted eels, called *Rampars*, which, it is ſaid, will attack both men and cattle, when in the water. It ſometimes overflows its banks; and in autumn 1782 and 1790, did much damage to the adjacent grounds.

(2.) ANNAN, the capital of Annandale, in Scotland; a ſmall town, containing 500 or 600 inhabitants, ſituated on the river. See N° 1. This place is a royal borough, has ſome trade in wine, and exports annually between 20 and 30,000 Winchester buſhels (10 and 15,000 bolls) of corn. Veſſels of about 250 tons can come within half a mile of the town; and of 60, as high as the bridge, which conſiſts of five arches, defended by a gateway. A fabric for carding and ſpinning cotton has lately been erected, and the population is upon the increaſe. Here was formerly a caſtle, which was built by the Bruces after they became lords of Annandale. Upon the death of David II. in 1371, this caſtle, Lochmaben, and the lordſhip of Annandale, came to Thomas Randolf earl of Murray, and went with his ſiſter Agnes to the Dunbars, earls of March: after their forfeiture it went to the Douglaſſes, who alſo loſt it by ſimilar conduct; and then having come to Alexander Duke of Albany, he, for rebelling againſt his brother king James III. and plundering the fair of Lochmaben in 1484, was alſo forfeited. Since that period it continued in the hands of the king, and became the great key of the weſt border. Lon. 3. 4. W. Lat. 55. 0. N.

ANNAND, William, dean of Edinburgh in Scotland, the ſon of William Annan miniſter of Air, was born at Air in 1633. Five years after, his father was obliged to quit Scotland with his family, on account of their loyalty to the king, and adherence to epiſcopal government. In 1651, young Annand was admitted a ſcholar in the univerſity college in Oxford; and though he was put under the care of a preſbyterian tutor, yet he took all occaſions to be preſent at the ſermons preached by the loyal divines. In 1656, being then A. B. he received holy orders from Dr Thomas Fulwar, biſhop of Ardfert or Kerry, in Ireland, and was appointed preacher at Weſton, near Biceſter in Oxfordſhire, where he met with great encouragement from Sir Francis Norris lord of that manor. After he had taken his degree of M. A. he was preſented to the vicarage of Leighton Buzzard in Bedfordſhire, where he diſtinguiſhed himſelf by his edifying manner of preaching, till 1662, when he went into Scotland, in quality of chaplain to John earl of Middleton, the king's high commiſſioner to the church of that kingdom. In the latter end of the year 1663, he was placed in the tolbooth church at Edinburgh, and removed ſome years after to the tron church of that city. In 1676, he was nominated by the king to the deanery of Edinburgh; and in 1685, he commenced D. D. in the univerſity of St Andrew's. He wrote, 1. *Fides Catholica*, or the Doctrine of the Catholic Church, in 18 grand ordinances, referring to the word, ſacrament, and prayer, in purity, number, and nature, catholically maintained, and publicly taught, againſt heretics of all ſorts. Lond. 1661-2, 4to. 2. Solutions of many proper and profitable queſtions ſuitable to the nature of each ordinance, &c. printed with the Fides Catholica. 3. *Poema Quotidianum*; or a ſhort diſcourſe tending to prove the legality, decency, and expediency, of ſet forms of prayers in the churches of Chriſt, with a particular defence of the book of Common Prayer of the Church of England, Lond. 1661, 4to. 4. *Pater Noſter*, or the Lord's Prayer explained, the ſenſe thereof, and the duties therein, from hiſtory, ſcripture, and the fathers, methodically cleared, and ſuccinctly opened. Lond. 1670, 8vo. 5. *Myſterium Pietatis*, or the myſtery of godlineſs, &c. Lond. 1672, 8vo. 6. *Doxologia*, or glory to the Father, the church's hymn reduced to glorify the Trinity, Lond. 1672, 8vo. 7. *Dualitas*, or a twofold ſubject diſplayed and opened, conduceable to godlineſs and peace in order: 1ſt, *Lex loquens*, the honour and dignity of magiſtracy, with the duties thereupon, &c. 2dly, *Duorum Unitas*, or the agreement of magiſtracy and miniſtry in the election of the honourable magiſtrates at Edinburgh, and opening of the dioceſan ſynod of the reverend clergy there. Edin. 1674, 4to. Dr Annand died the 13th of June 1689, and was interred in the Greyfriars church in Edinburgh.

ANNANDALE, a ſtewartry or diſtrict of Dumfries, of which Lochmaben caſtle was formerly the chief fortalice, is a fertile vale, 24 miles long, and about 14 miles broad. From its vicinity to England, and the continual incurſions and predatory wars of the borderers, the greateſt part of it was uncultivated and common; but ſince the beginning of the laſt century, or rather within the laſt 40 years, all theſe waſtes and commons have been divided and brought into culture, and the country has aſſumed a new appearance, which may be aſcribed not only to the diviſion of the commons, but likewiſe to the improvement made in the roads, and particularly in the great weſtern road from Edinburgh to London by Moffat, Gratney, and Carlyſle, running through this vale, and carried on by ſome gentlemen of the country, after they had obtained an act of Parliament for levying a toll to defray the expence of making and keeping it in repair. Annandale formed a part of the Roman province of Valentia; and Severus's wall ending here, it abounds with Roman ſtations and antiquities. The camps at Pirrens in Middlebie, and on the hill of Brunſwick, are ſtill entire, and their form is preſerved; and the traces and remains of a military road are viſible in different parts of the country. The ruins of the houſe or caſtle of Auchincaſs, in the neighbourhood of Moffat, once the ſeat of that potent baron Thomas Randolph, Earl of Murray, Lord of Annandale, and Regent of Scotland, in the minority of David II. covers above an acre of ground, and conveys an idea of the plan and ſtrength of the building. The ancient caſtle of Comlongan formerly belonged to the Murrays, Earls of Annandale, and now to Lord Stormont, is ſtill in a tolerable ſtate of preſervation; but except this caſtle

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and that of Heddom, moſt of the other old fortalices and towers are now taken down, or in ruins. Annandale is a marquiſate belonging to the chief of the name of Johnſton.

ANNANO, a fort of Italy, on the Tanaro, in the duchy of Milan. It was twice taken by the French; but was reſtored to the duke of Savoy in 1736. It is now once more in their poſſeſſion, by Buonaparte's recent victories. Lon. 8. 30. E. Lat. 44. 40. N.

ANNA PERENNA. See ANNA, N° 4.

ANNAPOLIS, the chief town in Maryland, in North America: which as yet is but mean, becauſe the people in this province chooſe to live on their plantations, as in Virginia. St Mary's was once the capital of the province of Maryland, and the town of Annapolis was known by the name of the *Severn*. It received its preſent name in 1694, when it was made a port town, and the reſidence of a collector and naval officer. Lon. 78. 10. W. Lat. 39. 25.

ANNAPOLIS ROYAL, a town of Nova Scotia, is ſeated in the bay of Fundy; and, though a mean place, was formerly the capital of the province. It has one of the fineſt harbours in America, capable of containing 1000 veſſels at anchor in the utmoſt ſecurity. The place is alſo protected by a fort and garriſon. At the bottom of the harbour is a point of land, which divides two rivers; and on each ſide there are pleaſant meadows, which in ſpring and autumn are covered with all ſorts of freſh-water fowl. There is a trade carried on by the Indians with furs, which they exchange for European goods. Lon. 64. 5. W. Lat. 45. 10. N.

ANNAS, or ANNANUS, the ſon of Seth, high prieſt of the Jews, and father-in-law to Caiaphas, who alſo enjoyed that office. Both of them were perſecutors of our Lord and his apoſtles. Annas was high prieſt eleven years in all, but as that office was then only annual, he alternately ſucceeded and was ſucceeded by his ſon-in-law, and four of his ſons, under Auguſtus and Tiberius.

ANNAT, Francis, a French jeſuit, and confeſſor to Lewis XIV. was born in 1590. His writings are numerous, in the Latin and French languages. He diſtinguiſhed himſelf particularly againſt the provincial Letters of M. Paſcal. He was a learned, liberal, and pious man. He died at Paris in 1670.

(1.) * ANNATS. *n. ſ. without ſingular.* [*annates*, Lat.] 1. Firſt fruits; becauſe the rate of firſt fruits paid of ſpiritual livings, is after one year's profit. *Cowel.* 2. Maſſes ſaid in the Romiſh church for the ſpace of a year, or for any other time, either for the ſoul of a perſon deceaſed, or for the benefit of a perſon living. *Ayliffe's Parerg.*

(1.) ANNATS, HISTORY OF. Antonius biſhop of Epheſus, firſt exacted from all biſhops conſecrated by him, a ſum proportionate to the annual revenues of their ſees. The council of Epheſus, held in 400, condemned this exaction, but not till Antoninus was dead. The time when annats were firſt introduced into Europe is obſcure; ſome refer it to the pontificate of Alexander IV. others to that of John XXII. who in the firſt year of his papacy, obtained a year's revenue of all the cathedral benefices. Clement V. is ſaid to have been the firſt pope who impoſed annats on England. In 1399, during the ſchiſm of the antipopes, Benedict IX. exacted a year's revenue of all the archbiſhopricks, biſhopricks, and abbies.—Matthew Paris, in his Hiſtory of England, for 746, relates, that the archbiſhop of Canterbury, in virtue of a grant of the pope, received annats of all the benefices in England. Among the laws of king Ina, who began his reign in 712, there is an order for the payment of them. In after times, the holy ſee took theſe from the biſhops and archbiſhops, and appropriated them to themſelves: but the parliament under Henry VIII. gave them to the crown, and Queen Anne reſtored them to the church, by appropriating them to the augmentation of poor livings.

(1.) ANNE, queen of Great Britain, ſecond daughter of James II. by his firſt wife, lady Anne Hyde, daughter of the Great earl of Clarendon, was born in 1664. In 1683, ſhe married prince George of Denmark, by whom ſhe had ſeveral children, but they all died young. On the death of William III. in 1702, ſhe aſcended the throne, and her reign was a continued blaze of public glory. Though naturally of a feeble character, and conſequently unfit to act decidedly for herſelf, ſhe was fortunate in having ſome of the ableſt ſtateſmen in the world. The domineering power of the French nation was completely ſubdued by the valour of the Britiſh troops, commanded by the duke of Marlborough; and an end put to a tedious war by the peace of Utrecht, in 1713. But one of the greateſt and moſt important events of this memorable reign, was the Union of the Engliſh and Scottiſh nations, which contributed more than all the other to the proſperity of the nation (See BRITAIN, HISTORY OF.) Yet amidſt all theſe ſucceſſes a contention of parties prevailed during the greateſt part of her reign; and towards the cloſe of it threatened to throw the nation into confuſion, which was prevented by her death, in Auguſt, 1714, in the 55th year of her age. Queen Anne, though too much the dupe of her miniſters and favourites, in her private character appeared amiable, and not without underſtanding; and that ſhe was beloved by her ſubjects the title of the *Good Queen Anne* ſufficiently evinces. From the number of literary characters who flouriſhed at this period, it has been ſtiled the Auguſtan age of Britain.

(2.) ANNE OF AUSTRIA, queen of France, was the daughter of Philip III. king of Spain. In 1615 ſhe married Lewis XIII. with whom ſhe lived on very diſagreeable terms, owing to the machinations of Cardinal Richelieu, who perſuaded her huſband that ſhe was engaged in conſpiracies. But Lewis dying, while his ſon was underage, ſhe became ſole regent during his minority. She, however brought upon herſelf the contempt and hatred of the nation, by placing her confidence in cardinal Mazarine, and was forced to fly from Paris. In a little time matters were accommodated; and when her ſon took the reins of government into his own hands, in 1661, ſhe gave up all concern with public affairs, and ſpent the remainder of her life in retirement. She died in 1666.

(3.) ANNE OF BEAUJEU, daughter of Lewis XI.

king of France. She was married to the duke of Bourbon, and during the minority of her brother Charles VIII. was appointed regent. She was an active and enterprising princeſs. She died in 1522.

(4.) ANNE BOLYEN. See BOLEYN.

(5.) ANNE OF BRITANY, daughter of Francis I. duke of Britany. She was married firſt to Maximilian of Auſtria, next to Charles VIII. of France, and afterwards to Lewis XII. his ſucceſſor. She was a high-minded woman, but liberal in her diſpoſition. She died in 1514, aged 38.

(6.) ANNE OF CLEVES, the wife of Henry VIII. king of England, was the daughter of John III. duke of Cleves. A portrait of her, drawn by Holbein, having been ſhewn to the Engliſh monarch by Thomas lord Cromwell, he demanded her in marriage; but it was not long before he was diſguſted with the *Flanders Mare* as he contemptuouſly called her, and a divorce enſued Anne, without ſeeming much diſconcerted returned to her own country, where ſhe died in 1557.

ANNE'S CHAPEL, ST, a village in Devonſhire, near Barnſtaple.

ANNE'S DAY, St, a feſtival of the Chriſtian church, celebrated by the Latins on the 26th of July, and by the Greeks on the 9th of December, in honour of Anna, the mother of the Virgin Mary.

ANNE'S HILL, ST, a village in Surrey, near Chertſey.

ANNE'S ST, a village in Eſſex, near Chelmsford.

* *To* ANNEAL. *v. a.* [*ælan*, to heat, Saxon.] 1. To heat glaſs, that the colours laid on it may pierce through.—When you purpoſe to *anneal*, take a plate of iron made fit for the oven; or take a blue ſtone, which being made fit for the oven, lay it upon the croſs bars of iron. *Peacham.* 2. To heat glaſs after it is blown, that it may not break. To heat any thing in ſuch a manner as to give it the true temper.

(1.) ANNEALING OF GLASS, by the workmen called *nealing*, is particularly uſed in making glaſs: it conſiſts in placing the bottles, &c. whilſt hot, in a kind of oven or furnace, where they are ſuffered to cool gradually; they would otherwiſe be too brittle for uſe.—Metals are rendered hard and brittle by hammering: they are therefore made red hot, in order to recover their malleability; and this is called *nealing*.—The difference between unannealed and annealed glaſs, with reſpect to brittleneſs, is very remarkable. When an unannealed glaſs veſſel is broken, it often flies into a ſmall powder, with a violence ſeemingly very unproportioned to the ſtroke it has received. In general, it is in greater danger of breaking from a very ſlight ſtroke than from one of ſome conſiderable force. One of thoſe veſſels will often reſiſt the effects of a piſtol bullet dropt into it from the height of two or three feet; yet a grain of ſand falling into it, will make it burſt into ſmall fragments. This takes place ſometimes immediately on dropping the ſand into it: but often the veſſel will ſtand for ſeveral minutes after ſeemingly ſecure; and then, without any new injury, it will fly to pieces. If the veſſel be very thin, it does not break in this manner, but ſeems to poſſeſs all the properties of annealed glaſs. The ſame phenomena are ſtill more ſtrikingly ſeen in glaſs drops or tears. They are globular at one end and taper to a ſmall tail at the other. They are the drops which fall from the melted maſs of glaſs on the rods on which the bottles are made. They drop into the tubs of water which are uſed in the work: the greater part of them burſt immediately in the water. When thoſe that remain entire are examined, they diſcover all the properties of unannealed glaſs in the higheſt degree. They will bear a ſmart ſtroke on the thick end without breaking; but if the ſmall tail be broken, they burſt into ſmall powder with a loud exploſion. They appear to burſt with more violence, and the powder is ſmaller in an exhauſted receiver than in the open air. When they are annealed, they loſe thoſe properties.—Glaſs is one of thoſe bodies which increaſe in bulk when paſſing from a fluid to a ſolid ſtate. When it is allowed to cryſtallize regularly, the particles are ſo arranged, that it has a fibrous texture: it is elaſtic, and ſuſceptible of long continued vibrations; but when a maſs of melted glaſs is ſuddenly expoſed to the cold, the ſurface cryſtallizes, and forms a ſolid ſhell round the interior fluid parts: this prevents them from expanding when they become ſolid. They, therefore, have not the opportunity of a regular cryſtallization; but are compreſſed together with little mutual coheſion: On the contrary they preſs outward to occupy more ſpace, but are prevented by the external cruſt. In conſequence of the effort of expanſion in the internal parts, the greater number of glaſs drops burſt in cooling; and thoſe which remain entire are not regularly cryſtalized. A ſmart ſtroke upon them communicates a vibratoin to the whole maſs, which is nearly ſynchronous in every part; and therefore the effort of expanſion has little more effect than if the body were at reſt; but the ſmall tail and the ſurface only are regularly cryſtallized. If the tail be broken, this communicates a vibration along the cryſtallized ſurface, without reaching the internal parts. By this they are allowed ſome expanſion; and overcoming the coheſion of the thin outer ſhell, they burſt it and are diſperſed in powder. In an unannealed glaſs veſſel the ſame thing takes place. Sometimes the vibration may continue for a conſiderable time before the internal parts overcome the reſiſtance. If the veſſel be very thin, the regular cryſtallization extends through the whole thickneſs; or at leaſt the quantity of compreſſed matter in the middle is ſo inconſiderable, as to be incapable of burſting the external plate.—By the proceſs of annealing, the glaſs is kept for ſome time in a ſtate approaching to fluidity; the heat increaſes the bulk of the cryſtallized part, and renders it ſo ſoft, that the internal parts have the opportunity of expanding and forming a regular cryſtallization.

(2.) ANNEALING OF IRON. A ſimilar proceſs is now uſed for rendering kettles and other veſſels of caſt iron leſs brittle: of it the ſame explanation may be given. The greater number of metals diminiſh in bulk, when they paſs from a fluid to a ſolid ſtate; iron on the contrary, expands. When caſt iron is broken, it has the appearance of being compoſed of grains: forged or bar iron ſeems to conſiſt of plates. Forged iron has long been procured, by placing a maſs of caſt iron under large hammers, and making it undergo violent

and

and repeated compreſſion. A proceſs is now uſed for converting caſt iron into forged, by heat alone. The caſt iron is placed in an air furnace, and kept for ſeveral hours in a degree of heat, by which it is brought near to a fluid ſtate. It is then allowed to cool gradually, and is found to be converted into forged iron. This proceſs is conducted under a patent; although, if Reamur's experiments upon caſt iron be conſulted, it will appear not to be a new diſcovery.—By theſe experiments it is aſcertained that if caſt iron be expoſed for any length of time to a heat conſiderably below its melting point, the texture and properties are not changed: but if it be kept in a heat near the melting point, the ſurface ſoon becomes lamellated like forged iron; and the lamellated ſtructure extends farther into the maſs in proportion to the length of time in which it is expoſed to that degree of heat. When it is continued for a ſufficient time, and then allowed to cool gradually, it is found to poſſeſs the lamellated ſtructure throughout.—Caſt iron, then, is brittle, becauſe it has not had the opportunity of cryſtallizing regularly. When it is expoſed to cold while fluid, the ſurface becoming ſolid, prevents the inner parts from expanding and arranging themſelves into regular cryſtals. When caſt iron is brought near to the melting point, and continued for a ſufficient length of time in that degree of heat, the particles have the opportunity of arranging themſelves into that form of cryſtals by which forged iron is diſtinguiſhed, and by which it poſſeſſes cohefion and all its properties.—There appears, therefore, to be no other eſſential difference between forged and caſt iron, except what ariſes from the cryſtallization. Caſt iron is indeed often not ſufficiently purified from other ſubſtances which are mixed with the calx. It appears alſo to contain a conſiderable quantity of calx unreduced; for during the proceſs for converting it into forged iron by heat alone, a pale flame riſes from the metal till near the end of the proceſs. This is owing to fixed air which the heat forces off from the calx. The expulſion of this air reduces the calx and thereby frees the metal from that injurious mixture. That this explanation of the annealing of iron is probable appears alſo from the well known fact of forged iron being incomparably more difficult of fuſion than caſt iron. A piece of forged iron requires a violent heat to melt it; but when it is reduced to a ſmall powder, it melts in a much lower degree of heat. Iron diminiſhes in bulk when it paſſes into a fluid ſtate, while moſt other metals increaſe in volume. The expanſion which heat occaſions to bring them to their melting point, will be favourable to their fluidity, by gradually bringing the particles to the ſame ſtate of ſeparation in which they are when the maſs is fluid; but the expanſion of iron by heat removes it farther from that ſtate, and keeps it in the ſtate which is favourable to the continuance of it in a cryſtallized form. It will not melt till the heat expand it ſo much that the cohefion of cryſtallization be overcome. When it is reduced to a minute powder before it be expoſed to the heat, it melts ſooner. The chryſtals having been deſtroyed, that cohefion has no effect in preventing it from paſſing into a ſtate of fluidity. Upon the ſame principles may be explained the almoſt peculiar property of welding poſſeſſed by iron, and the converſion of forged iron into ſteel.

(3.) ANNEALING OF PLATINA. The principles of annealing might perhaps alſo be applied to platina, a metal which has lately gained much attention. It poſſeſſes ſome of the properties of iron. It is ſtill more difficult of fuſion than that metal. It is ſuſceptible of being welded. The natural grains of it can ſcarcely be melted in the focus of the moſt powerful burning glaſs; but when it is diſſolved in aqua regia, and precipitated by the vegetable alkali, it has been melted in ſmall globules, by the blow pipe. When precipitated by ſal ammoniac, it has been melted in a conſiderable maſs in the heat of a furnace; but it is ſaid to be hard and brittle. Many attempts have been made to procure a maſs of it in a malleable ſtate, but without ſucceſs. It is ſaid, that the proceſs is now diſcovered by a chemiſt in Spain. The treatment of the metal is probably very ſimple. Perhaps, it only conſiſts in precipitating it in a minute powder in aqua regia, expoſing it to a ſtrong heat to melt it, and keeping it for ſome time in a ſtate nearly fluid, that it may, like iron, cryſtallize regularly; by this it will poſſeſs all its metallic properties.

(1.) ANNECY, a city of France, in the department of Mont Blanc, ſeated on the banks of the Lake Annecy, (ſee N°. 2.) 70 miles S. of Geneva, and 22 NE. of Chamberry. There are piazzas in moſt of the ſtreets, which ſhelter the inhabitants from rain. It has ſeveral collegiate and pariſh churches, as well as convents for men and women. Lon. 6. 12. E. Lat. 45. 53. N.

(2.) ANNECY, a lake in the department of Mont Blanc, 9 miles long, and 4 broad; from which run ſeveral rivulets, that flow through the city Annecy, and afterwards unite and form the river Siar.

ANNENBURG, a caſtle of Courland.

ANNENHOF, an imperial ſeat of Ruſſia, near Peterſburg, on the banks of the Neva.

(1.) ANNESLEY, Arthur, Earl of Angleſey, and lord privy ſeal under Charles II. was the ſon of Sir Francis Anneſley, Bart. Lord Mount-Norris, and was born at Dublin, in 1614. At the age of 16, he was entered of Magdalen College, Oxford, and afterwards followed the law at Lincoln's Inn. He had a conſiderable ſhare in the public tranſactions of the laſt century: for in the beginning of the civil war, he ſat in the parliament held at Oxford in 1643; but afterwards became reconciled to the oppoſite party, and was ſent commiſſioner to Ulſter, to oppoſe the deſigns of the rebel Owen Roe Oneal. He was preſident of the council of ſtate, after the death of Oliver, and was principally concerned in bringing about the Reſtoration; ſoon after which, King Charles II. created him baron Anneſley, and afterwards Earl of Angleſey; and in 1667, he was made treaſurer of the navy. In 1672, he was appointed a commiſſioner for inſpecting the ſettlements of Ireland, and the next year was made lord privy ſeal. In October 1680, he was charged by one Dangerfield, upon oath, at the bar of the Houſe of Commons, with endeavouring to ſtifle evidence in relation to the Popiſh plot, and to promote the be-

lief of a Presbyterian one. The uneasiness he received from this attack did not prevent his speaking his opinion freely in the House of Lords, in regard to the Popish plot. He also answered Lord Castlehaven's Memoirs, in which that nobleman endeavoured to paint the Irish rebellion in the lightest colours; and a sharp dispute was raised, which ended in the seals being taken from him; on which he retired to his country seat, where he devoted himself to his studies. He was a person of great abilities, had uncommon learning, and was well acquainted with the constitution and laws of England. He wrote, besides his Animadversions on Castlehaven's Memoirs, 1. The Privileges of the House of Lords and Commons stated. 2. A Discourse on the House of Lords. 3. Memoirs. 4. The History of the Troubles in Ireland, from the rebellion in 1641 till the restoration. 5. Truth unveiled, in behalf of the Church of England; and some other works. He died in 1686, aged 73.

(4.) ANNESLEY, Samuel, a non-conformist divine, born in Cumberland, in 1620. He was a grandson by the mother's side, of the famous John Wesley, founder of the methodists, and was educated at Queen's college, Oxford, where he obtained the degree of LL. D. in consequence of the zeal he displayed in defence of the parliament, during the rebellion; and the vehement spirit manifested in some of his sermons against the crown and church, procured for him a presentation to the vicarage of St Giles, Cripplegate; but from this he was ejected, in 1662, for non-conformity. He died in 1696, aged 76. Some of his sermons were printed.

(5.) ANNESLEY, a small town of Nottinghamshire, near Sherwood Forest.

ANNET, one of the Scilly isles. It is uninhabited, but at low water, the foundations of ruined habitations are visible, which are supposed to have been destroyed by the sea. There are some druidical relics upon it.

* ANNEX. *n. s.* [from *To annex.*] The thing annexed, additament.—Failing in his first attempt to be but like the highest in heaven, he hath obtained of men, to be the same on earth, and hath accordingly assumed the *annexes* of divinity. *Brown.*

* *To* ANNEX. *v. a.* [*annecto, annexum*, Lat: *annexer*, Fr.] 1. To unite to at the end; as, he *annexed* a codicil to his will. 2. To unite; as, a smaller thing to a greater; as, he *annexed* a province to his kingdom. 3. To unite *à posteriori*: annexion always presupposing something: thus we may say, punishment is *annexed* to guilt; but not guilt to punishment.—Concerning fate or destiny, the opinions of those learned men, that have written thereof, may be safely received, had they not thereunto *annexed* and fastened an inevitable necessity, and made it more general and universally powerful than it is. *Raleigh.*

(1.) * ANNEXATION. *n. s.* [from *annex.*] 1. Conjunction; addition.—If we can return to that charity and peaceable mindedness, which Christ so vehemently recommends to us, we have his own promise, that the whole body will be full of light. *Matt.* vi. that all other christian virtues will, by way of concomitance or *annexation*, attend them. *Hammond.* 2. Union; act or practice of adding or uniting.—How *annexations* of benefices first came into the church, whether by the prince's authority, or the pope's licence, is a very great dispute. *Ayliffe's Parergon.*

(2.) ANNEXATION, in law, the uniting of lands or rents to the crown.

* ANNEXION. *n. s.* [from *annex.*] The act of annexing; addition.—It is necessary to engage the fears of men, by the *annexion* of such penalties as will overbalance temporal pelasure. *Rogers.*

* ANNEXMENT. *n. s.* [from *annex.*] 1. The act of annexing. 2. The thing annexed.—

Where it falls,
Each small *annexment*, petty consequence,
Attends the boist'rous ruin. *Shakespeare.*

ANNIBAL. See HANNIBAL.

ANNIENTED. See ANIENTED.

* ANNIHILABLE. *adj.* [from *annihilate.*] That which may be reduced to nothing; that which may be put out of existence.

* *To* ANNIHILATE. *v. a.* [*ad* and *nihilum*, Lat.] 1. To reduce to nothing; to put out of existence.—It is impossible for any body to be utterly *annihilated*; but that as it was the work of the omnipotency of God, to make something of nothing; so it requireth the like omnipotency to turn somewhat into nothing. *Bacon.* 2. To destroy, so as to make the thing otherwise than it was,—The flood that hath altered, deformed, or rather *annihilated* this place, so as no man can find any mark or memory thereof. *Raleigh.* 3. To annul; to destroy the agency of any thing.—There is no reason that any one commonwealth should *annihilate* that whereupon the whole world has agreed. *Hooker.*

(1.) * ANNIHILATION. *n. s.* [from *annihilate.*] The act of reducing to nothing. The state of being reduced to nothing.—God hath his influence into the very essence of things, without which their utter *annihilation* could not choose but follow. *Hooker.*

(2.) ANNIHILATION DIFFERENT OPINIONS CONCERNING. Christians, Heathens, Jews, Siamese, Persians, divines, philosophers, &c. have their peculiar systems, sentiments, conjectures, not to say *dreams*, concerning annihilation; and we find great disputes among them about the reality, the possibility, the means, measures, prevention, ends, &c. of annihilation. The first notions of the production of a thing from, or reduction of it to, nothing, Dr Burnet shows, arose from the Christian theology; the words *creation* and *annihilation*, in the sense now given to them, having been equally known to the Hebrews, the Greeks, and the Latins. The ancient philosophers in effect, denied all annihilation as well as creation, resolving all the changes in the world into new modifications, without supposing the production of any thing new, or destruction of the old. By daily experience they saw compounds dissolved; and that in their dissolution nothing perished but their union or connection of parts: when in death the body and soul were separated, the man they held was gone, but that the spirit remained in its original the great soul of the world, and the body in its earth from whence it came; these were again wrought by nature into new compositions, and entered new states of being

being which had no relation to the former. The Perſian bramins hold, that after a certain period of time, conſiſting of 71 joogs, God not only annihilates the whole univerſe, but every thing elſe, angels, ſouls, ſpirits, and all, by which he returns to the ſame ſtate he was in before the creation; but that, having breathed a while, he goes to work again, and a new creation ariſes, to ſubſiſt 71 joogs more, and then to be annihilated in its turn. Thus they hold there have been almoſt an infinite number of worlds: but how many joogs are elapſed ſince the laſt creation, they cannot certainly tell; only in an almanac written in the Sanſcrit language in 1670, the world is ſaid to be then 3,892,771 years old from the laſt creation. The Talapoins hold it the ſupreme degree of happineſs to have the ſoul totally annihilated, and freed from the burden and ſlavery of tranſmigrations. They ſpeak of three Talapoins, who, after a great number of tranſmigrations, became gods; and when arrived at this ſtate, procured this further reward of their merit to be annihilated! The ultimate reward of the higheſt perfection man can arrive at is *nieurepan*, or annihilation; which at length is granted to thoſe who are perfectly pure and good, after their ſouls have wandered many thouſand years through various bodies! The Siameſe heaven is exactly the hell of ſome Socinians and other Chriſtian writers; who, ſhocked with the horrible proſpect of eternal torments, have taken refuge in the ſyſtem of annihilation. This ſyſtem ſeems countenanced by Scripture; for the words, *death*, *deſtruction*, and *periſhing*, whereby the puniſhment of the wicked is moſt frequently expreſſed in Scripture, do moſt properly import annihilation and an utter end of being. To this Tillotſon anſwers, that theſe words, as well as thoſe correſponding to them in other languages, are often uſed, both in Scripture and other writings, to ſignify a ſtate of great miſery, and ſuffering, without the utter extinction of the miſerable. Thus God is often ſaid in Scripture to bring *deſtruction* on a nation, when he ſends judgments upon them, but without exterminating or making an end of them. So, in other languages, it is frequent, by *periſhing*, to expreſs a perſon's being made miſerable; as in that known paſſage in Tiberius's letter to the Roman ſenate: *ita me dii, deæque omnes, pejus perdant, quam hodie perire me ſentio.* As to the word *death*, a ſtate of miſery which is as bad or worſe than death, may properly enough be called by that name; and thus the puniſhment of wicked men after the day of judgment is in the book of Revelations frequently called the *ſecond death*.

(3.) ANNIHILATION, OPINIONS OF CHRISTIANS RESPECTING. Some Chriſtian writers allow a long time of the moſt terrible torments of ſinners; and after that ſuppoſe that there ſhall be an utter end of their being. Of this opinion Irenæus appears to have been; who, according to M. du Pin, taught that the ſouls, at leaſt of the wicked, would not ſubſiſt eternally; but that, after having undergone their torments for a certain period, they would at laſt ceaſe to be at all. But Tillemont, Petit, Didier, and others, endeavour to defend Irenæus from this imputation, as being *too favourable* to the wicked. It has been much diſputed among divines, whether, at the conſummation of all things, this *earth* is to be annihilated, or only purified, and fitted for the habitation of ſome new order of beings. Gerard in his Common Places, and Hakewil in his Apology, contend earneſtly for a total abolition or annihilation. Ray, Calmet, and others, think the ſyſtem of renovation or reſtitution more probable, and more conſonant to Scripture, reaſon, and infinite mercy. The fathers who have treated on the queſtion are divided; ſome holding that the univerſe ſhall not be annihilated, but only its external face changed; others aſſerting, that the ſubſtance of it ſhall be deſtroyed. The ſentiments of mankind have differed very widely as to the poſſibility and impoſſibility of annihilation! According to ſome, nothing ſo difficult; it requires the infinite power of the Creator to effect it: ſome go further, and ſeem to put it out of the power of God himſelf! According to others, there is nothing ſo eaſy: Exiſtence is a ſtate of violence; all things are continually endeavouring to return to their primitive nothing: it requires no power at all; it will do of itſelf; nay, what is more, it requires an infinite power to prevent it. Many authors conſider preſervation as a continual re-production of a thing, which, ſubſiſting no longer of itſelf, would every moment return into nothing. Gaſſendi on the contrary aſſerts, that the world may indeed be annihilated by the ſame power which firſt created it, but that to continue it there is no occaſion for any power of preſervation. Some divines, of which number the learned Biſhop King ſeems to be, hold annihilation for the greateſt of all evils, worſe than even the utmoſt torments of hell flames; while others, with ſome of the eaſtern philoſophers, take annihilation for the ultimate pitch of happineſs human nature is capable of; that ſovereign good, that abſolute beatitude, ſo long vainly ſought for by the philoſophers! No wonder it had been ſo long concealed; for who would have thought of looking for the *ſummum bonum*, where others have placed the ſum of miſery? The ſaid prelate propoſes it as a queſtion, Whether ſuffering eternal torments be a greater evil than not exiſting? He thinks it highly probable, that the damned will be ſuch fools, that, feeling their own miſery in the moſt exquiſite degree, they will rather applaud their own conduct, and chooſe to be, and to be what they are, rather than not to be at all; fond of their condition, however wretched, like people enraged, they will perſiſt in their former ſentiments without opening their eyes to their folly, and perſevere by way of indignation and revenge. Mr Bale refutes him on this head; but might, one would think, have ſaved himſelf the trouble.

ANNI NUBILES, *i. e.* marriageable years, in law, denotes the marriageable age of a woman, viz. after ſhe has arrived at twelve.

ANNIS COMMUNIBUS. See COMMUNIBUS.

ANNISEED. See ANISE SEED.

ANNISOR, a river in Pembrokeſhire.

(1.) * ANNIVERSARY. *adj.* [*anniverſarius*, Lat.] Returning with the Revolution of the year; annual; yearly.—The heaven whirled about with admirable celerity, moſt conſtantly finiſhing its *anniverſary* viciſſitudes. *Ray.*—They deny giving any

any worſhip to a creature, as inconſiſtent with chriſtianity; but confeſs the honour and eſteem for the martyrs, which they expreſſed by keeping their *anniverſary* days, and recommending their example. *Stillingfleet.*

(2.) * ANNIVERSARY. *n. ſ.* [*anniverſarius*, Lat.] 1. A day celebrated as it returns in the courſe of the year.—For encouragement to follow the example of martyrs, the primitive chriſtians met at the places of their martyrdom, to praiſe God for them, and to obſerve the *anniverſary* of their ſufferings. *Stillingfleet.* 2. The act of celebration, or performance, in honour of the anniverſary day.—Donne had never ſeen Mrs Drury, whom he has made immortal in his admirable *anniverſaries. Dryden.* 3. *Anniverſary* is an office in the Romiſh church, celebrated not only once a year, but which ought to be ſaid daily through the year, for the ſoul of the deceaſed. *Ayliffe's Parergon.*

ANN-LITTLE, a ſmall town in Hampſhire, near Whervel.

ANNOBON, a ſmall iſland of Africa, on the coaſt of Loango, belonging to the Portugueſe; ſo called from its being diſcovered on New-year's day. According to Pyrard, it is about five or ſix French leagues in compaſs; but Bandrand ſays, it is ten leagues round. Here are two high mountains, the tops of which being continually covered with clouds, occaſion frequent rains. On the SE. of the iſland are two rocks; one of which is low, and upon a level with the ſurface of the ſea; the other higher and larger, but both dangerous in the night to ſhipping; but between them the channel is deep and clear. Theſe rocks are inhabited by vaſt numbers of birds, ſo tame, that the ſailors frequently catch them with their hands. On the ſame ſide of the iſland is a convenient watering place at the foot of a rivulet, which tumbles from the mountains down to a valley covered with orange and citron trees, &c. and affording a pleaſant and refreſhing ſhade; but the road on the NW. ſide is difficult and dangerous, though moſt frequented by ſhips who have no intention of touching upon the continent. In either place it is difficult to take in a ſufficient quantity of water, on account of the violent breakings of the ſea, and a ſtone intrenchment erected by the negroes, from which they annoy all ſtrangers that attempt to land. The beſt road for ſhipping lies on the NE. ſide, where they may anchor in 7, 10, 13, or 16 fathoms, on a fine ſand cloſe to the land, oppoſite to the village where the negroes have thrown up their intrenchments. The climate is wholeſome, and the air clear and ſerene for the greateſt part of the year. Every part of the iſland is watered by pleaſant brooks, and freſh water ſprings, which, however, at the new and full moons, or in all high tides, acquire a brakiſhneſs. The banks of every rivulet are covered with palms; whence the inhabitants extract their wine by inciſion. Here are a number of fertile valleys, which produce Turkey corn, rice, millet, yams, potatoes, &c. and afford paſture for abundance of oxen, ſheep, goats, &c. Poultry and fiſh alſo abound here; but the only mercantile production is cotton, which is eſteemed equal in quality to any produced in India, though the quantity is ſmall. In 1605, the Dutch Admiral Matelief found 200 negroes, and two Portugueſe, on Annobon, moſt of them able to bear arms, expert in the uſe of them, and trained up in military diſcipline. La Croix ſays, it has a town oppoſite to the road that contains above 100 houſes, the whole ſurrounded by a parapet. Moſt of their dwellings are cane huts. In the whole iſland there is not a ſingle houſe built of ſtone, and only two of wood, which belong to the Portugueſe. All the inhabitants are meanly clothed; the women go bare-headed, and have alſo the upper part of the body naked, modeſty being defended by a piece of linen wrapt under their ſtomach, and falling down in the form of a petticoat, or wide apron, to the knees. The men wear only a linen girdle round the loins, with a ſmall flap before. The women carry their children on their backs, and ſuckle them over the ſhoulder. All the inhabitants are ſubject to the Portugueſe governor, who is the chief perſon in the iſland. The negroes have their own chief, ſubordinate to him. They are all rigid catholics, having been either compelled or perſuaded by the Portugueſe to embrace that faith; and, like all other converts, they are bigotted in proportion to the novelty of the belief, and their ignorance of the true tenets. Lon. 5. 10. E. Lat. 1. 5e. S.

* ANNO DOMINI. [Lat.] In the year of our Lord; as, *anno domini*, or *A. D.* 1751; that is, in the ſeventeen hundred and fifty-firſt year from the birth of our Saviour.

ANNOCK, a ſmall river in Ayrſhire, which ſeparates the united pariſhes of Dreghorn and Perciletown, from thoſe of Irvine and Stewartown.

* ANNOISANCE. *n. ſ.* [from *annoy*, but not now in uſe.]—It hath a double ſignification. Any hurt done either to a publick place, as highway, bridge, or common river, or to a private, by laying any thing that may breed infection, by encroaching, or ſuch like means: The writ that is brought upon this tranſgreſſion. See NUISANCE, the word now uſed. *Blount.*

* ANNOLIS. *n. ſ.* An American animal, like a lizard.

ANNOMÆANS. See ANOMÆANS.

ANNOMINATION, in rhetoric, the ſame with what is otherwiſe called *paronomaſia*. See PARONOMASIA.

(I.) ANNONA, in antiquity, denotes proviſion for a year of all ſorts, as of fleſh, corn, wine, hay, and ſtraw, which was annually provided by the contractors for the maintenance of an army.

(II.) ANNONA, in botany, the CUSTARD APPLE. A genus of the polygynia order, belonging to the polyandria claſs of plants; and in the natural method ranking under the 32d order, Coadunatæ. The characters are: The calyx is a triphyllous perianthium: The corolla conſiſts of ſix heart-ſhaped petals: The ſtamina have ſcarcely any filaments; the antheræ are numerous ſitting on the receptaculum: The piſtillum has a roundiſh germen; no ſtyli; the ſtigmata obtuſe and numerous: The pericarpium is a large roundiſh unilocular berry, covered with a ſcaly bark: The ſeeds are numerous. There are 8 ſpecies; viz.

1. ANNONA AFRICANA, is not particularly deſcribed by botaniſts, ſo far as we have ſeen, except-

cepting that it produces a ſmooth bluiſh kind of apples.

2. ANNONA ASIATICA, or purple apple, grows in ſome of the French iſlands, as well as in Cuba, in great plenty. The trees riſe to the height of 30 feet or more. The fruit is eſteemed by the inhabitants of thoſe iſlands, who frequently give them to ſick perſons.

3. ANNONA CHERIMOLA, is a native of Peru, where it is much cultivated for the fruit, and grows to be a very large tree, well furniſhed with branches. The leaves are of a bright green colour, and much larger than thoſe of any of the other ſorts. The fruit is oblong, and ſcaly on the outſide, of a dark purple colour when ripe, and the fleſh is ſoft and ſweet, intermixed with many brown ſeeds which are ſmooth and ſhining.

4. ANNONA MURICATA, or ſour-ſop, rarely riſes above 20 feet high, but is well furniſhed with branches; the leaves are broad, have a ſmooth ſurface without any furrows, and are of a ſhining green colour: the fruit is large, of an oval ſhape, irregular, and pointed at the top, of a greeniſh yellow colour, and full of ſmall knobs on the outſide: the pulp is ſoft, white, and of a ſour and ſweet taſte intermixed, having many oblong, dark coloured ſeeds.

5. ANNONA PALUSTRIS, or water apple, grows to the height of 30 or 40 feet. The leaves are oblong, pointed, with ſome ſlender furrows, and have a ſtrong ſcent when rubbed; the fruit is ſeldom eaten but by negroes. The tree grows in moiſt places in all the Weſt India iſlands.

6. ANNONA RETICULATA, or cuſtard apple, is a native of the Weſt Indies, where it grows to the height of 25 feet, and is well furniſhed with branches on every ſide: the bark is ſmooth, and of an aſh colour; the leaves are a light green, oblong, and have ſeveral deep tranſverſe ribs or veins, ending in acute points; the fruit is of a conical form, as large as a tennis ball, of an orange colour when ripe, having a ſoft, ſweet, yellowiſh pulp, of the conſiſtence of a cuſtard, from whence it has its name.

7. ANNONA SQUAMOSA, or ſweet ſop, ſeldom riſes higher than 15 feet, and well furniſhed with branches on every ſide. The leaves have an agreeable ſcent when rubbed; the fruit is roundiſh and ſcaly, and when ripe turns of a purple colour, and hath a ſweet pulp.

8. ANNONA TRILOBA, or North American annona, called by the inhabitants *papaw*, is a native of the Bahama Iſlands, and likewiſe of Virginia and Carolina. The trunks of the trees are ſeldom bigger than the ſmall part of a man's leg, and are about 10 or 13 feet high, having a ſmooth greeniſh brown bark. In March, when the leaves begin to ſprout, the bloſſoms appear, conſiſting of 6 greeniſh white petals. The fruit grows in cluſters of 3 or 4 together: when ripe, they are yellow, covered with a thin ſmooth ſkin, which contains a yellow pulp, of a ſweet luſcious taſte. In the middle of this pulp, lie in 2 rows 12 ſeeds, divided by as many thin membranes. All parts of the tree have a rank, if not a fetid, ſmell; nor is the fruit reliſhed by many except negroes. Theſe trees grow in low ſhady ſwamps, and in a very fat ſoil. This laſt ſort will thrive in the open air in Britain, if it is placed in a warm and ſheltered ſituation; but the plants ſhould be trained up in pots, and ſheltered in winter for two or three years till they have acquired ſtrength. The ſeeds frequently remain a whole year in the ground, and therefore the earth in the pots ought not to be diſturbed, though the plants do not come up the firſt year. If the pots where thoſe plants are ſown are plunged into a new hot bed, they will come up much ſooner than thoſe that are expoſed to the open air. All the other ſorts require to be kept in a warm ſtove, or they will not live in this country.

ANNONÆ PRÆFECTUS, in Roman antiquity, an extraordinary magiſtrate, whoſe buſineſs it was to prevent a ſcarcity of proviſion, and to regulate the weight and fineneſs of bread.

ANNONÆ STRUCTOR, the ſteward of the military proviſions among the ancient Romans.

ANNONAGE, ANNONAGIUM, a tax on corn.

ANNONARIUS, in Roman antiquity, the diſtributor of proviſions among the ſoldiers: alſo a monopoliſt.

ANNONAY, a town of France in the department of Ardeche, ſeated at the confluence of the Cances and Deumes, 12 miles SW. of Vienne. A great paper manufacture is carried on in this town, which is famed for being the place where M. Montgolfier, the proprietor, firſt diſcovered rarefied air balloons. See AEROSTATION, INDEX. Lon. 4. 55. E. Lat. 45. 15. N.

ANNONE, a fort of Italy, belonging to Montferrat, on the borders of the Milaneſe; ſeated on the Tanaro, 9 miles E. from Aſti. Lon. 28. 14. E. Lat. 44. 28. N.

ANNOSITY, agedneſs. *Bailey.*

ANNOT, a ſmall town of France, in the department of the Lower Alps. Lon. 7. 0. E. Lat. 44. 4. N.

(1.) * ANNOTATION. *n. ſ.* [*annotatio*, Lat.] Explications or remarks written upon books; notes.—It might appear very improper to publiſh *annotations*, without the text itſelf whereunto they relate. *Boyle.*

(2.) ANNOTATION, in civil law, denotes a kind of reſcript or grant of the Emperor, ſigned with his own hand. It took its name from the note or ſubſcription at the bottom, which was in red letters.

(3.) ANNOTATION, in medicine, denotes the firſt beginning of a febrile paroxyſm, when the patient grows chill, ſhudders, yawns, is drowſy, and the like.

* ANNOTATOR. *n. ſ.* [Lat.] A writer of notes or annotations; a ſcholiaſt; a commentator.—I have not that reſpect for the *annotators* which they generally meet with in the world. *Felton on the Claſſicks.*

ANNOTTA. } See ANOTTA.
ANNOTTO. }

* *To* ANNOUNCE. *v. a.* [*annoncer*, Fr. *annuncio*, Lat.] 1. To publiſh; to proclaim.—

Of the Meſſiah I have heard foretold
By all the prophets; of thy birth at length
Announc'd by Gabriel with the firſt I knew.
Milton.

2. To pronounce; to declare by a judicial ſentence.—

Thoſe

Thoſe, mighty Jove, mean time thy glorious care,
Who model nations, publiſh laws, *announce*
Or life or death. *Prior.*

* ANNOY. *n. ſ.* [from the verb.] Injury; moleſtation; trouble.—

What then remains, but, after paſt *annoy*,
To take the good viciſſitude of joy. *Dryden.*

* *To* ANNOY. *v. a.* [*annoyer*, Fr.] To incommode; to vex; to teaze; to moleſt.—

Woe to poor man; each outward thing *annoys* him;
He heaps in inward grief, that moſt deſtroys him. *Sidney.*

* ANNOYANCE. *n. ſ.* [from *annoy.*] 1. That which annoys; that which hurts.—

A grain, a duſt, a gnat, a wand'ring hair,
Any *annoyance* in that precious ſenſe. *Shakeſp.*

2. The ſtate of being annoyed; or act of annoying.—The greateſt *annoyance*, and diſturbance of mankind, has been from one of thoſe two things, force or fraud. *South.*

* ANNOYER. *n. ſ.* [from *To annoy.*] The perſon that annoys.

* ANNUAL. *adj.* [*annuel*, Fr. from *annus*, Lat.] 1. That which comes yearly.—

Annual for me, the grape, the roſe, renew,
The juice nectarious, and the balmy dew. *Pope.*

2. That which is reckoned by the year.—

The king's majeſty's
Does purpoſe honour to you; to which
A thouſand pounds a year *annual* ſupport,
Out of his grace he adds. *Shakeſp. Henry* VIII.

3. That which laſts only a year.—The dying in the winter of the roots of plants that are *annual*, ſeemeth to be cauſed by the over-expence of the ſap; which being prevented, they will ſuperannuate, if they ſtand warm. *Bacon.*

ANNUAL EPACTS. See EPACT.

ANNUAL EQUATION. See EQUATION.

ANNUAL LEAVES, as diſtinguiſhed from evergreens, are ſuch as come up afreſh in the ſpring, and periſh in winter.

ANNUAL MOTION OF THE EARTH. See ASTRONOMY.

ANNUAL PLANTS, or ſimply ANNUALS, are ſuch as only come up in ſpring, and die in autumn; and therefore muſt be renewed every year.

ANNUAL RENT is uſed, in Scots law, to denote the intereſt due by a debtor in a ſum of money to a creditor for the uſe of it.

ANNUAL RENT, RIGHT OF, in Scots law, the original method of burdening lands with an yearly payment for the loan of money, before the taking of intereſt for money was allowed by ſtatute.

ANNUALIA, 1. yearly oblations anciently made by the relations of deceaſed perſons on the day of their death, and on which maſs was celebrated with great ſolemnity: 2. the prieſts ſalary for celebrating maſs annually.

* ANNUALLY. *adv* [from *annual.*] Yearly; every year.—By two drachms they thought it ſufficient to ſignify a heart; becauſe the heart at one year weigheth two drachms, that is a quarter of an ounce; and unto fifty years *annually* encreaſeth the weight of one drachm. *Brown.*

ANNUA PENSIONE, a writ formerly iſſued from the king to an abbot or prior, demanding an annual penſion due for his chaplains.

ANNUEL OF NORWAY, of which mention is made in the acts of Parliament of King James III. was an annual payment of 100 marks Sterling, which the kings of Scotland were obliged to pay to the kings of Norway, in ſatisfaction for ſome pretenſions which the latter had to the Scottiſh kingdom, by virtue of a conveyance made thereof by Malcolm Canmore. This annuel was firſt eſtabliſhed in 1266; in conſideration whereof the Norwegians renounced all title to the ſucceſſion of the iſles of Scotland. It was paid till the year 1468, when the annuel, with all its arrears, was renounced in the contract of marriage between King James III. and Margaret daughter of Chriſtian I. king of Norway, Denmark, and Sweden.

ANNUENTES MUSCULI, [from *annuere*, to nod,] in anatomy, a pair of tranſverſe muſcles, at the root of the vertebræ of the back, called alſo recti interni minores.

* ANNUITANT. *n. ſ.* [from *annuity.*] He that poſſeſſes or receives an annuity.

ANNUITIES.

INTRODUCTION.

ALTHOUGH ANNUITIES, in ſtrict propriety of language, cannot be denominated a SCIENCE, being only a branch of practical arithmetic, or rather of algebra, founded upon probabilities drawn from facts, yet as the ſubject is acknowledged to be of no ſmall importance in the preſent ſtate of ſociety, and has accordingly employed the pens of many eminent calculators, we think it proper, not only to treat it ſcientifically, but to inſert it in the form of a ſeparate branch of ſcience.

DEFINITION *and* DIVISIONS *of* ANNUITIES.

ANNUITIES imply any periodical income, ariſing from money lent, or from houſes, lands, ſalaries, penſions, &c. payable from time to time, either annually, or at other intervals of time.—Annuities may be divided into ſuch as are CERTAIN, and ſuch as depend on ſome CONTINGENCY, as the continuance of a life, &c. Annuities are alſo divided into annuities in POSSESSION, and annuities in REVERSION; the former meaning ſuch as have commenced; and the latter, ſuch as will not commence till ſome particular event has happened, or till ſome given period of time has elapſed. Annuities may be farther conſidered as payable *yearly*, or *half yearly*, or *quarterly*, &c.

ANNUITIES may be ſuppoſed to be improved either in the way of ſimple or compound intereſt. The laſt of theſe hypotheſes, being the moſt equitable, both for ſeller and buyer, is commonly aſſumed.

SECT.

SECT. I. ANNUITIES CERTAIN.

THE PRESENT VALUE of an annuity, is that ſum, which, being improved at intereſt, will be ſufficient to pay the annuity. The *preſent value* of an *annuity certain*, payable yearly, is calculated in the following manner. Let the annuity be 1, and let r denote the amount of 1 l. for a year, or 1 l. increaſed by its intereſt for one year. Then, 1 being the preſent value of the ſum r, and having to find the preſent value of the ſum 1, it will be, by proportion thus, $r : 1 :: 1 : \frac{1}{r}$ the preſent value of 1 l. due a year hence. In like manner, $\frac{1}{r}$ will be the preſent value of 1 l. due two years hence; for $r : 1 :: \frac{1}{r} : \frac{1}{r^2}$. In like manner, $\frac{1}{r^3}$, $\frac{1}{r^4}$, $\frac{1}{r^5}$, &c. will be the preſent value of 1 l. due at the end of 3, 4, 5, &c. years reſpectively; and in general, $\frac{1}{r^n}$ will be the value of 1 l. to be received after the expiration of n years. Conſequently the ſum of all theſe, or $\frac{1}{r} + \frac{1}{r^2} + \frac{1}{r^3} + \frac{1}{r^4}$ + &c. continued to n terms, will be the preſent value of all the n years annuities. And the value of the perpetuity, is the ſum of the ſeries continued *ad infinitum*.

But this ſeries, it is evident, is a geometrical progreſſion, whoſe firſt term and common ratio are each $\frac{1}{r}$, and the number of its terms n; and therefore the ſum s of all the terms, or the preſent value of all the annual payments, will be $s = \frac{1}{r-1} - \frac{1}{r-1} \times \frac{1}{r^n}$.

When the annuity is a perpetuity, it is plain, that the laſt term $\frac{1}{r^n}$ vaniſhes, and therefore $\frac{1}{r-1} \times \frac{1}{r^n}$ alſo vaniſhes; and conſequently the expreſſion becomes barely $s = \frac{1}{r-1}$; that is, any annuity divided by the intereſt of 1 l. for one year, is the value of the perpetuity.

If the annuity is not to be entered on immediately, but after a certain number of years, as m years; then the preſent value of the reverſion is equal to the difference between two preſent values, the one for the firſt term of m years, and the other for the end of the laſt term n: that is, equal to the difference between $\frac{1}{r-1} - \frac{1}{r-1} \times \frac{1}{r^n}$ and $\frac{1}{r-1} - \frac{1}{r-1} \times \frac{1}{r^m}$, or $= \frac{1}{r-1} \times \left(\frac{1}{r^m} - \frac{1}{r^n}\right)$. Hence alſo the preſent worth of perpetuity in reverſion, of 1 l. to commence after m years, is, $\frac{1}{r-1} \times \frac{1}{r^m}$.

Annuities certain differ in value, as they are made payable *yearly*, *half-yearly*, or *quarterly*.—And by proceeding as above, uſing the intereſt or amount of a half year, or a quarter, as thoſe for the whole year were uſed, the following ſet of theorems will ariſe; where r denotes, as before, the amount of 1 l. and its intereſt for a year, and n the number of years, during which any annuity is to be paid; alſo P denotes the perpetuity $\frac{1}{r-1}$, Y denotes $\frac{1}{r-1} - \frac{1}{r-1} \times \frac{1}{r^n}$ the value of the annuity ſuppoſed payable yearly, H the value of the ſame when it is payable half-yearly, and Q the value when payable quarterly; or univerſally, M the value when it is payable every m part of a year.

THEOR. 1. $Y = P - P \times (\frac{1}{r})^n$.

THEOR. 2. $H = P - P \times (\frac{2}{r+1})^{2n}$.

THEOR. 3. $Q = P - P \times (\frac{1}{r+1})^{4n}$.

THEOR. 4. $M = P - P \times (\frac{m}{r+m-1})^{mn}$.

EXAMPLE.

Let the rate of intereſt be 4 per cent, and the term 5 years; and conſequently $r = 1{\cdot}04$, $n = 5$, $P = 25$; and alſo let $m = 12$, or the intereſt payable monthly in theorem 4: then the preſent value of ſuch annuity of 1 l. a-year, for 5 years, according as it is ſuppoſed payable 1 l. yearly, or 1 half of a pound every half year, or 1 fourth of a pound every quarter, or 1 twelfth of a pound, every month, or 1 twelfth part of a year, will be as follows:

$Y = 25 - 25 \times {\cdot}821928 = 4{\cdot}4518$
$H = 25 - 25 \times {\cdot}820348 = 4{\cdot}4913$
$Q = 25 - 25 \times {\cdot}819543 = 4{\cdot}5114$
$M = 25 - 25 \times {\cdot}818996 = 4{\cdot}5251$

ANNUITIES may be conſidered as in arrears, or as forborn for any number of years; in which caſe each payment is to be conſidered as a ſum put out to intereſt for the remainder of the term after the time it becomes due. And as 1 l. due at the end of 1 year amounts to r at the end of another year, and to r^2 at the end of the third year, and to r^3 at the end of the 4th year, and ſo on; therefore, by adding always the laſt year's annuity, or 1, to the amounts of all the former years, the ſum of all the annuities and their intereſts will be the ſum of the following geometrical ſeries $1 + r + r^2 + r^3 + r^4$ ------ to r^{n-1}, continued till the laſt term be r^{n-1}, or till the number of terms be n, the number of years the annuity is forborn. But the ſum of this geometrical progreſſion is $\frac{r^n - 1}{r - 1}$ which therefore is the amount of 1 l. annuity forborn for n years. And this quantity being multiplied by any other annuity a, inſtead of 1, will produce the amount of that other annuity.

TABLE I.

AMOUNT *of an* ANNUITY *of* 1 *l. at* COMPOUND INTEREST.

Yrs	at 3 *per cent.*	3½ *per cent.*	4 *per cent.*	4½ *per cent.*	5 *per cent.*	6 *per cent.*
1	1·00000	1·00000	1·00000	1·00000	1·00000	1·00000
2	2·03000	2·03500	2·04000	2·04500	2·05000	2·06000
3	3·09090	3·10623	3·12160	3·13703	3·15250	3·18360
4	4·18363	4·21494	4·24646	4·27819	4·31013	4·37462
5	5·30914	5·36247	5·41632	5·47071	5·52563	5·63709
6	6·46841	6·55015	6·63298	6·71689	6·80191	6·97532
7	7·66246	7·77941	7·89829	8·01915	8·14201	8·39384
8	8·89234	9·05169	9·21423	9·38001	9·54911	9·89747
9	10·15911	10·36850	10·58280	10·80211	11·02656	11·49132
10	11·46388	11·73139	12·00611	12·28821	12·57789	13·18079
11	12·80780	13·14199	13·48635	13·84118	14·20679	14·97164
12	14·19203	14·60196	15·02581	15·46403	15·91713	16·86994
13	15·61779	16·11303	16·62684	17·15991	17·71298	18·88214
14	17·08632	17·67699	18·29191	18·93211	19·59863	21·01507
15	18·59891	19·29568	20·02359	20·78405	21·57856	23·27597
16	20·15688	20·97103	21·82453	22·71934	23·65749	25·67253
17	21·76159	22·70502	23·69751	24·74171	25·84037	28·21288
18	23·41444	24·49969	25·64541	26·85508	28·13138	30·90565
19	25·11687	26·35718	27·67123	29·06358	30·53900	33·75999
20	26·87037	28·27968	29·77808	31·37143	33·06595	36·78559
21	28·67649	30·26947	31·96920	33·78314	35·71925	39·99273
22	30·53678	32·32890	34·24797	36·30338	38·50521	43·39229
23	32·45288	34·46041	36·61789	38·93703	41·43048	46·99583
24	34·42647	36·66653	39·08260	41·68920	44·50200	50·81558
25	36·45926	38·94986	41·64591	44·56521	47·72710	54·86541
26	38·55304	41·31310	44·31174	47·57064	51·11345	59·15638
27	40·70963	43·75906	47·08421	50·71132	54·66913	63·70577
28	42·93092	46·29063	49·96758	53·99333	58·40258	68·52811
29	45·21885	48·91080	52·96629	57·42303	62·32271	73·63980
30	47·57542	51·62268	56·08494	61·00707	66·43885	79·05819
31	50·00268	54·42947	59·32834	64·75239	70·76079	84·80168
32	52·50276	57·33450	62·70147	68·66625	75·29883	90·88978
33	55·07784	60·34121	66·20953	72·75623	80·06377	97·34316
34	57·73018	63·45315	69·85791	77·03026	85·06696	104·18375
35	50·46208	66·67401	73·65222	81·49662	90·32031	111·43478
36	63·27594	70·00760	77·59831	86·16397	95·83632	119·12087
37	66·17422	73·45787	81·70225	91·04134	101·62814	127·26812
38	69·15945	77·02889	85·97034	96·13820	107·70955	135·90421
39	72·23423	80·72491	90·40915	101·46442	114·09502	145·05846
40	75·40126	84·55028	95·02552	107·03032	120·79977	154·76197
41	78·66330	88·50954	99·82654	112·84669	127·83976	165·04768
42	82·02320	92·60737	104·81960	118·92479	135·23175	175·95054
43	85·48389	96·84863	110·01238	125·27640	142·99334	187·50758
44	89·04841	101·23833	115·41288	131·91384	151·14301	199·75803
45	92·71986	105·78167	121·02939	138·84997	159·70016	212·74351

Yrs.	at 3 per cent.	3½ per cent.	4 per cent.	4½ per cent.	5 per cent.	6 per cent.
46	96·50146	110·48403	126 87057	146·09821	168·68516	226·50812
47	100·39650	115·35097	132·94539	153·67263	178·11942	241·09861
48	104·40840	120·38826	139·26321	161·58790	188 02539	256·56453
49	108·54065	125·60185	145·83373	169·85936	198·42666	272·95840
50	112·79689	130 99791	152·66708	178·50303	209·34800	290·33590
51	117·18077	136·58284	159·77377	187·53566	220 81540	308·75606
52	121·69620	142·36324	167·16472	196·97477	232·85617	328·28142
53	126·34708	148·34595	174·85131	206·83863	245·49897	348·97831
54	131·13750	154·53806	182·84536	217·14637	258·77392	370·91701

TABLE II.

The PRESENT VALUE *of an* ANNUITY *of* 1 *l.*

Yrs.	at 3 per cent.	3½ per cent.	4 per cent.	4½ per cent.	5 per cent.	6 per cent.
1	0·97087	0·96618	0·96154	0·95694	0·95238	0·94340
2	1·91347	1·89966	1·88610	1·87267	1·85941	1·83339
3	2·82861	2·80164	2·77059	2·74896	2·72325	2·67301
4	3·71710	3·67308	3·62990	3·58753	3·54595	3·46511
5	4·57971	4·51505	4·45182	4·38998	4·32948	4·21236
6	5·41719	5·32855	5·24214	5·15787	5·07569	4·91732
7	6·23028	6·11454	6·00205	5·89270	5·78637	5·58238
8	7·01969	6·87396	6·73274	6·59589	6·46321	6·20979
9	7·78611	7·60769	7·43533	7·26879	7·10782	6·80169
10	8·53020	8·31661	8·11090	7·91272	7·72173	7·36009
11	9·25262	9·00155	8·76048	8·52892	8·30541	7·88687
12	9·95400	9·66333	9·38507	9·11858	8·86325	8·38384
13	10·63496	10·30274	9·98565	9·68285	9·39357	8·85268
14	11 29607	10·92052	10·56312	10·22283	9·89864	9·29498
15	11 93794	11·51741	11·11839	10·73955	10·37966	9·71225
16	12·56110	12·09411	11·65230	11·23402	10·83777	10·10590
17	13·16612	12·65132	12·16567	11·70719	11·27407	10·47726
18	13·75351	13·18968	12·65930	12·15999	11·68959	10·82760
19	14·32380	13·70984	13·13394	12·59329	12·08532	11·15812
20	14·87747	14·21240	13·59033	13·00794	12·46221	11·46992
21	15·41502	14·69797	14·02916	13·40472	12·82115	11·79408
22	15·93692	15·16712	14·45112	13·78442	13·16300	12·04158
23	16 44361	15·62041	14·85684	14·14777	13·48857	12·30338
24	16·93554	16·05837	15·24696	14·49548	13·79864	12·55040
25	17·41315	16·48151	15·62208	14·82821	14·09394	12·78336
26	17·87683	16·89035	15·98277	15·14661	14·37519	13·00317
27	18·32703	17·28536	16·32959	15·45130	14·64303	13·21053
28	18·76411	17·66702	16·66306	15·74287	14·89813	13·40616
29	19·18845	18·03577	16·98371	16·02189	15·14107	13·59072
30	19·60044	18·39205	17·29203	16·28889	15·37245	13·76483
31	20·00043	18·73628	17·58849	16·54439	15·59281	13·92909
32	20·38877	19·06887	17·87355	16·78889	15·80268	14·08484
33	20·76579	19·39021	18·14765	17·02266	16·00255	14·23023
35	21·13184	19·70068	18·41120	17·24676	16·19290	14·36814
35	21·48722	20·00066	18·66461	17·46101	16·37419	14·49825

Yrs	3 per cent.	3½ per cent.	4 per cent.	4½ per cent.	5 per cent.	6 per cent.
36	21·83225	20·29049	19·90828	17·66604	16·54685	14·62099
37	22·16724	20·57053	19·14258	17·86124	16·71129	14·73678
38	22·49246	20·84109	19·36786	18·04999	16·86789	14·84602
39	22·80822	21·10250	19·58448	18·22966	17·01704	14·94907
40	23·11477	21·35507	19·79277	18·40158	17·15909	15·04630
41	23·41249	21·59910	19·99305	18·56611	17·29437	15·13802
42	23·70136	21·83488	20·18563	18·72355	17·42321	15·22454
43	23·98190	22·06269	20·37079	18·87421	17·54591	15·30617
44	24·25429	22·28279	20·54884	19·01838	17·66277	15·38318
45	24·51871	22·49545	20·72004	19·15635	17·77407	15·45583
46	24·77545	22·70092	20·88465	19·28837	17·88007	15·52437
47	25·02471	22·89944	21·04294	19·41471	17·98102	15·58903
48	25·26671	23·09124	21·19513	19·53561	18·07716	15·65003
49	25·50166	23·27656	21·34147	19·65130	18·16872	15·70757
50	25·72976	23·45562	21·48218	19·76201	18.25593	15·76186
51	25·95123	23·62862	21·61749	19·86795	18·33898	15·81308
52	26·16624	23·79576	21·74758	19·96933	18·41807	15·86139
53	26·37499	23·95726	21·87267	20·06634	18·49340	15·90697
54	26·57766	24·11330	21·99296	20·15918	18·56515	15·94998

The Use of Table I.

To find the AMOUNT *of an* ANNUITY FOR ON *any number of years.* Take out the amount from the 1st table, for the propoſed years and rate of intereſt; then multiply it by the annuity in queſtion; and the product will be its amount for the ſame number of years, and rate of intereſt.

And the converſe to find the rate of time.

Examp. 1. To find how much an annuity of 50 l. will amount to in 20 years at 3½ per cent. compound intereſt.—On the line of 20 years, and in the column of 3½ per cent. ſtands 28·27968, which is the amount of an annuity of 1l. for the 20 years; and therefore 28·27968 multiplied by 50, gives 1413·984 l. or 1413 l. 19s. 8d. for the anſwer.

Examp. 2. In what time will an annuity of 20 l. amount to a 1000 l. at 4 per cent. compound intereſt?—Here the amount of 1000 l. divided by 20l. the annuity, gives 50, the amount of 1l. annuity for the ſame time and rate. Then, the neareſt tabular number in the column of 4 per cent. is 49·96758, which ſtanding on the line of 28, ſhews that 28 years is the anſwer.

Examp. 3. If it be required to find at what rate of intereſt an annuity of 20 l. will amount to 1000 l. forborn for 28 years. Here 1000 divided by 20 gives 50 as before. Then looking along the line of 28 years, for the neareſt to this number 50, I find 49·96758 in the column of 4 per cent. which is therefore the rate of intereſt required.

The Use of Table II.

Examp. 1. To find the preſent value of an annuity of 50 l. which is to continue 20 years, at 3½ per cent.—By the table, the preſent value of 1 l. for the ſame rate and time, is 14·21240; therefore 14·21240 × 50 = 710·62 l. or 710 l. 12s. 4d. is the preſent value ſought.

Examp. 2. To find the preſent value of an annuity of 20 l. to commence 29 years hence, and then to continue for 40 years, or to terminate 50 years hence, at 4 per cent. intereſt.—In ſuch caſes as this, it is plain we have to find the difference between the preſent values of two equal annuities, for the two given times; which therefore will be effected by ſubtracting the tabular value of the one term from that of the other, and multiplying by the annuity. Thus,

tabular value for 50 years	21·48218
tabular value for 10 years	8·11090
the difference	13·37128
multiplied by	20
gives	267·4256
or	267 l. 8s. 6d. the anſwer.

Sect. II. Contingent, or Life Annuities.

The value of annuities for life is determined from obſervations made of the bills of mortality. Dr Halley, Mr Simpſon, and Monſ. de Moivre, are gentlemen of diſtinguiſhed merit in calculations of this kind.

Dr Halley had recourſe to the bills of mortality at Breſlaw, the capital of Sileſia, as a proper ſtandard for the other parts of Europe, being a place pretty central, at a diſtance from the ſea, and not much crowded with traffickers or foreigners. He pitches upon 1000 perſons all born in one year, and obſerves how many of theſe were alive every year, from their birth to the extinction of the laſt, and conſequently how many died each year, as in the firſt of the following tables, which is well adapted to Europe in general. But in the city of London, there is obſerved to be a greater diſparity in the births and burials than in any other place, owing probably to the vaſt reſort of people thither, in the way of commerce from all parts of the known world. Mr Simpſon therefore, in order to have a table particularly ſuited

suited to this populous city, pitches upon 1280 persons all born in the same year, and records the number remaining alive each year till none were in life.

TABLE III.

DR HALLEY'S TABLE *on the* BILLS *of* MORTALITY *at* BRESLAW.

Age.	*Pers. liv.*	*A.*	*Pers. liv.*	*A.*	*Pers. liv.*	*A.*	*Pers. liv.*
1	1000	24	573	47	377	70	142
2	855	25	567	48	367	71	131
3	798	26	560	49	357	72	120
4	760	27	553	50	346	73	109
5	732	28	546	51	335	74	98
6	710	29	539	52	324	75	88
7	692	30	531	53	313	76	78
8	680	31	523	54	302	77	68
9	670	32	515	55	292	78	58
10	661	33	507	56	282	79	49
11	653	34	499	57	272	80	41
12	646	35	490	58	262	81	34
13	640	36	481	59	252	82	28
14	634	37	472	60	242	83	23
15	628	38	463	61	232	84	20
16	622	39	454	62	222	85	15
17	616	40	445	63	212	86	10
18	610	41	436	64	202	97	8
19	604	42	427	65	192	88	5
20	598	43	417	66	182	89	3
21	592	44	407	67	172	90	1
22	586	45	397	68	162	91	0
23	579	46	387	69	152		

TABLE IV.

MR SIMPSON'S TABLE *on the* BILLS *of* MORTALITY *at* LONDON.

Age.	*Pers. liv.*	*A.*	*Pers. liv.*	*A.*	*Pers. liv.*	*A.*	*Pers. liv*
0	1280	24	434	48	220	72	59
1	870	25	426	49	212	73	54
2	700	26	418	50	204	74	49
3	635	27	410	51	196	75	45
4	600	28	402	52	188	76	41
5	580	29	394	53	180	77	38
6	564	30	385	54	172	78	35
7	551	31	376	55	165	79	32
8	541	32	367	56	158	80	29
9	532	33	583	57	151	81	26
10	524	34	493	58	144	82	23
11	517	35	340	59	137	83	20
12	510	36	331	60	130	84	17
13	504	37	322	61	123	85	14
14	498	38	313	62	117	86	12
15	492	39	304	63	111	87	10
16	486	40	297	64	105	88	8
17	480	41	284	65	99	89	6
18	474	42	274	66	93	90	5
19	468	43	264	67	87	91	4
20	462	44	255	68	81	92	3
21	455	45	246	69	75	93	2
22	448	46	237	70	69	94	1
23	441	47	228	71	64	95	0

From the preceding tables the probability of the continuance or extinction of human life is estimated as follows.

I. The probability that a person of a given age shall live a certain number of years, is measured by the proportion, which the number of persons living at the proposed age has to the difference between the said number, and the number of persons living at the given age.

Thus, if it be demanded, what chance a person of 40 years has to live seven years longer? From 445, the number of persons living at 40 years of age in Dr Halley's table, subtract 377, the number of persons living at 47 years of age, and the remainder, 68, is the number of persons that died during these 7 years; and the probability, or chance that the person in the question shall live these 7 years, is as 377 to 68, or nearly as $5\frac{1}{2}$ to 1. By Mr Simpson's table, the chance is something less than that of 4 to 1.

II. If the year, to which a person of a given age has an equal chance of arriving before he dies, be required, it may be found thus: Find half the number of persons living at the given age in the tables, and in the column of age you have the year required.

Thus, if the question be put with respect to a person of 30 years of age, the number of that age in Dr Halley's table is 531, the half whereof is 265, which is found in the table between 57 and 58 years; so that a person of 30 years has an equal chance of living between 27 and 28 years longer.

III. By the tables, the premium of insurance upon lives may in some measure be regulated.

Thus, the chance that a person of 25 years has to live another year, is, by Dr Halley's table, as 80 to 1; but the chance that a person of 50 years has to live a year longer is only 30 to 1. And, consequently, the premium for insuring the former ought to be to the premium for insuring the latter for one year, as 30 to 80, or as 3 to 8.

In order to facilitate computations of annuities on lives, Monf. de Moivre assumed the age of 86 as the utmost probable extent of life, and supposed that equal numbers died at all ages, so that of 86 persons born at the same time, it might be expected one would die each year till the whole be extinct. The difference between any proposed age and 86 is called the complement of life.

PROB. I. To determine the value of an annuity of 1 l. to continue during the life of a person of a given age, allowing compound interest at a given rate.

It has been shown, concerning annuities certain, that if r be put for the amount of 1 l. and its interest for a year, the present value of 1 l. payable at the end of 1, 2, or more years is expressed by $\frac{1}{r}$, $\frac{1}{r^2}$ &c. But as the right to each annual payment depends on the continuance of life, we must multiply each of these terms, by the number expressing the probability, that the annuitant shall live to the end of 1, 2, or more years. Now, if n represents the number of persons alive at any age, and a the number of persons that die in the first year thereafter, then the number of persons

perſons that live to the end of that year, is $n-a$. But the probability of the happening of any event is meaſured by a fraction, whoſe numerator is the number of chances it has to happen, and whoſe denominator is the number of chances it has both to happen and fail, therefore $\frac{n-a}{n}$ will repreſent the chance a perſon of that age has to live another year. In like manner putting b for the number of perſons that die in the courſe of the ſecond year, the probability that the annuitant ſhall live to the end of 2 years is $\frac{n-b}{n}$ and ſo on. Therefore the value of the annuity is $\frac{n-a}{n\,r} + \frac{n-b}{n\,r^2}$ &c. continued to the extremity of life.

If we aſſume M. de Moivre's hypotheſis, n is equal to the complement of life, and a, b, &c. each equal to 1, and the preceding ſeries becomes $\frac{n-1}{n\,r} + \frac{n-2}{n\,r^2}$ &c. which ſeries is the difference between $\frac{1}{r} + \frac{1}{r^2} + \frac{1}{3^4}$ &c. and $\frac{1}{n} + \left(\frac{1}{r} + \frac{2}{r^2} + \frac{3}{r^3}\right.$ &c.) The former of theſe being a geometrical ſeries is equal to $\frac{1}{r-1} - \frac{1}{r-1} \times \frac{1}{r^n} =$ (if we put $p = \frac{1}{r^n}$) $\frac{1-p}{r-1}$, and the latter is equal to $\frac{1}{n} \times \left(\frac{r}{r-1} - \frac{n}{r^n} \times \frac{1}{r-1} - \frac{1}{r^n} \times \frac{r}{r-1^2}\right) = \left(\frac{1-p.\,r}{r-1^2} - \frac{np}{r-1}\right) \times \frac{1}{n}$ Therefore $\frac{n-1}{n\,r} + \frac{n-2}{n\,r^2}$ &c. to n terms is equal to $\frac{1-p}{r-1} - \frac{1}{n} \times \left(\frac{1-p.\,r}{r-1^2} - \frac{n\,p}{r-1}\right) = \frac{(n-1+p).\,r-n}{n.\,r-1^2}$ the value of the annuity received. Here p is the preſent value of 1 l. due at the end of the complement of the life in queſtion, which may be either computed arithmetically, or taken from a table of the preſent value of 1 l. But the above theorem may be alſo accommodated to our II. table, for putting the preſent value of 1 l. annuity for the complement of life, or $\frac{1-p}{r-1} = A$, we get the preſent value of the life annuity of 1 l. equal to $\frac{1 - \frac{r}{n} A}{r-1}$. This theorem may be expreſſed in words at length, as follows:

Rule. Find the complement of life; and, by Table II. find the value of 1 l. annuity for the years denoted by the ſaid complement; multiply this value by the amount of 1 l. for a year, and divide the product by the complement of life; then ſubtract the quot. from 1; divide the remainder by the intereſt of 1 l. for a year; and this laſt quot will be the value of the annuity ſought; or in other words, the number of years purchaſe the annuity is worth.

Examp. What is the value of an annuity of 1 l. for an age of 50 years, intereſt at 5 *per cent.*?

86
50 are given.
36 complement of life.

By the tables, the value is, 16.5468
Amount of 1 l. for a year, 1.05

82.7340
1654.68

Complement of life, 36)17.374140(.482615
From unity, viz. 1.000000
Subtract .482615

Intereſt of 1 l. .05)517385(10.3477 value ſought.

By the preceding problem is conſtructed the following table.

TABLE V.

The VALUE *of* 1 *l.* ANNUITY *for a* SINGLE LIFE.

Age.	3 per c.	3½ per c.	4 per c.	4½ per c.	5 per c.	6 per c.
9=10	19.87	18.27	16.88	15.67	14.61	12.84
8=11	19.74	18.16	16.79	15.59	14.54	12.79
7=12	19.60	18.05	16.70	15.52	14.48	12.74
13	19.47	17.94	16.60	15.44	14.41	12.69
6=14	19.33	17.82	16.51	15.36	14.34	12.63
15	19.19	17.71	16.41	15.27	14.27	12.58
16	19.05	17.59	16.31	15.19	14.20	12.53
5=17	18.90	17.47	16.21	15.10	14.12	12.48
18	18.76	17.34	16.10	15.01	14.05	12.42
19	18.61	17.22	16.00	14.92	13.97	12.36
4=20	18.46	17.09	15.89	14.83	13.89	12.30

Age.	3 per c.	3½ per c.	4 per c.	4½ per c.	5 per c.	6 per c.
21	18.30	16 96	15.78	14.74	13.81	12.24
22	18.15	16.83	15.67	14.64	13.73	12.18
23	17.99	16.70	15.55	14.54	13.64	12.11
3=22	17.83	16.56	15.44	14.44	13.55	12.04
25	17.66	16.42	15.32	14.34	13.47	11.98
26	17.50	16.28	15.20	14.23	13.37	11.91
27	17.33	16.13	15.07	14.13	13.28	11.84
28	17.15	15.98	14.95	14.02	13.19	11.76
29	16.98	15.83	14.82	13 90	13.09	11.69
30	16 80	15.68	14.68	13.79	12.99	11.61
2=31	16.62	15.53	14.55	13.67	12.88	11.53
32	16.44	15.37	14.41	13.55	12.78	11.45
33	16.25	15.21	14.27	13.43	12.67	11.36
34	16.06	15.04	14.13	13.30	12.56	11.26
35	15.86	14.87	13 98	13.17	12.45	11.19
36	15.67	14.70	13.83	13.04	12.33	11.10
37	15.46	14.52	13.68	12.91	12.21	11.00
38	15.26	14.34	13.52	12.77	12.09	10.97
1=39	15.05	14.16	13.36	12.63	11.97	10.81
40	14.84	13.98	13.20	12.48	11.84	10.70
41	14.63	13.79	13.03	12.34	11.70	10.60
42	14 41	13.60	12.86	12.18	11.57	10.49
43	14.19	13.40	12.68	12.03	11.43	10.38
44	13.96	13.20	12.50	11.87	11.29	10.26
45	13.73	12.99	12.32	11.71	11.13	10.14
46	13.49	12.78	12.13	11.55	10.99	10.02
47	13.25	12.57	11.94	11.37	10.84	9.89
48	13.01	12.35	11.75	11.19	10.68	9.76
49	12.76	12.13	11.55	11.01	10.51	9.63
50	12.51	11.90	11.34	10.83	10.35	9.49
51	12.26	11 67	11.13	10.64	10.18	9.35
52	11.99	11.44	10.92	10.44	10.00	9.20
53	11.73	11.20	10.70	10.24	9.82	9.05
54	11.46	10 95	10.48	10.04	9.63	8.89
55	11.18	10.70	10 25	9.83	9.44	8.73
56	10.90	10.44	10.01	9.61	9.24	8.56
57	10.62	10.18	9.77	9.39	9.04	8.39
58	10.32	9.91	9.53	9.17	8.83	8.21
59	10.03	9 64	9 27	8.93	8.61	8.02
60	9.73	9.36	9.02	8.69	8.39	7.83
61	9.42	9 08	8.75	8.45	8.16	7.63
62	9.11	8.79	8.48	8.20	7.93	7.43
63	8.79	8.49	8.20	7.94	7.68	7.22
64	8.46	8.19	7.92	7.67	7.43	6.99
65	8.13	7.88	7.63	7.40	7.18	6.77
66	7.79	7.56	7.33	7.12	6.91	6.53
67	7.45	7.24	7.03	6.83	6.64	6.29
68	7.10	6 90	6.71	6.54	6.36	6.04
69	6.74	6.56	6 39	6.23	6.07	5.78
70	6 38	6.22	6.06	5.92	5.77	5.51
71	6.01	5.87	5.73	5.60	5.47	5.23
72	5.63	5.50	5.38	5.26	5.15	4.94
73	5.25	5.14	5.03	4.93	4.83	4.64
74	4.85	4.76	4.67	4.58	4.49	4.32
75	4.45	4.37	4.29	4.22	4.14	4.00

Age.	3 per c.	3½ per c.	4 per c.	4½ per c.	5 per c.	6 per c.
76	4.05	3 98	3.92	3.85	3.78	3.66
77	3 63	3·57	3·52	3·47	3·41	3·31
78	3.24	3·16	3·11	3.08	3.03	2.95
79	2.78	2·74	2.71	2 67	2.64	2.58
80	2.33	2.31	2 28	2.26	2.23	2.20

The above table ſhows the value of an annuity of one pound for a ſingle life, at all the current rates of intereſt; and is eſteemed the beſt table of this kind extant, and preferable to any other of a different conſtruction. But yet thoſe who ſell annuities have generally one and a half or two years more value, than ſpecified in the table, from purchaſers whoſe age is 20 years or upwards. Annuities of this ſort are commonly bought or ſold at ſo many years purchaſe; and the value aſſigned in the table may be ſo reckoned. Thus the value of an annuity of one pound for an age of 50 years, at 3 *per cent.* intereſt is 12.51; that is 12l. 10s. or twelve and a half years purchaſe. The marginal figures on the left of the column of age ſerve to ſhorten the table, and ſignify, that the value of an annuity, for the age denoted by them, is the ſame with the value of an annuity for the age denoted by the numbers before which they ſtand. Thus the value of an annuity for the age of 9 and 10 years is the ſame; and the value of an annuity for the age of 6 and 14, for the age of 3 and 24, &c. is the ſame. The further uſe of the table will appear in the queſtions and problems following.

Queſt. 1. A perſon of 50 years would purchaſe an annuity for life of 200l.: What ready money ought he to pay, reckoning intereſt at 4½ *per cent?*

	L.
By the table the value of 1l. is	10.8
Multiply by	200

Ans. Value to be paid in ready money 2164.00.

Queſt. 2. A young merchant marries a widow lady of 40 years of age, with a jointure of 300l. a year, and wants to diſpoſe of the jointure for ready money: What ſum ought he to receive, reckoning intereſt at 3½ *per cent.?*

	L.
By the table the value of 1l. is	13.98
	300

Answer. Value to be received in ready money . . . . . 4194.00.

By aſſuming ſtill as a hypotheſis, that the decrements of life are nearly equal, we might now give the mathematical inveſtigations of other problems relative to this ſubject. But as in many caſes they become intricate, it may be ſufficient, under this article, to give rules in words at length for performing ſome of the moſt uſeful of them.

Prob. 2. To find the value of an annuity for the joint continuance of two lives, one life failing, the annuity to ceaſe.

Here there are two caſes, according as the ages of the two perſons are equal or unequal.

1. If the two perſons are of the ſame age, work by the following

Rule. Take the value of any one of the lives from the table; multiply this value by the intereſt of 1l. for a year; ſubtract the product from 1; divide the foreſaid value by the remainder; and the quot will be the value of 1l. annuity, or the number of years purchaſe ſought.

Examp. What is the value of 100l. annuity for the joint lives of two perſons, of the age of 30 years each, reckoning intereſt at 4 *per cent.?*

By the table, one life of 30 years is . .	14.68
Multiply by	.04
Subtract the product . .	58.72
From	1.0000
Remains	1.4128

And 1.4128)14.68(10.39 value of 1l. annuity.

And 10.39 = 100 × 1039 the value ſought.

2. If the two perſons are of different ages, work as directed in the following

Rule. Take the values of the two lives from the table; multiply them into one another, calling the reſult the firſt product; then multiply the ſaid firſt product by the intereſt of 1l. for a year, calling the reſult the ſecond product; add the values of the two lives, and from their ſum ſubtract the ſecond product; divide the firſt product by the remainder, and the quot will be the value 1l. annuity, or the number of years purchaſe ſought.

Examp. What is the value of 70l. annuity for the joint lives of two perſons, whereof one is 40 and the other 50 years of age, reckoning intereſt at 5 *per cent.?*

By the table the value of 40 years is .	11.83
And the value of 50 years is	10.35
Firſt product,	122.4405
Multiply by .	.05
Second product,	6.122025
Sum of the two lives, ...	22.180000
Second product deduct, ...	6.122025
Remainder,	16.057975

And 16.057975)122.4405(7.62 value of 1l. annuity.

70

533.40 value ſought.

Prob. 3. To find the value of an annuity upon the longeſt of two lives; that is, to continue ſo long as either of the perſons is in life.

Rule. From the ſum of the values of the ſingle lives ſubtract the value of the joint lives, and the remainder will be the value ſought.

Examp.

EXAMP. What is the value of an annuity of 1l. upon the longeſt of 2 lives, the one perſon being 30, and the other 40 years of age, intereſt at 4 *per cent.*?

By the table, 30 years is	14.68
40 years is	13.20
Value of their joint lives, by Prob. 2. Caſe 2. is,	27.88 / 9.62
Value ſought, ...	18 26

If the annuity be any other than 1l. multiply the anſwer found as above by the given annuity.

If the two perſons be of equal age, find the value of their joint lives by Caſe 1. of Prob. 2.

PROB. 4. To find the value of the next preſentation to a living.

RULE. From the value of the ſucceſſor's life ſubtract the joint value of his and the incumbent's life, and the remainder will be the value of 1l. annuity; which multiplied by the yearly income, will give the ſum to be paid for the next preſentation.

EXAMP. A enjoys a living of 100l. *per annum*, and B would purchaſe the ſaid living for his life after A's death: The queſtion is, What he ought to pay for it, reckoning intereſt at 5 *per cent.* A being 60, and B 25 years of age?

	L.
By the table B's life is	13.46
Joint value of both lives, by Prob. 2. is	6.97
The value of 1l. annuity, ...	6.49
Multiplied by	100
Value of next preſentation, ...	649.00

The value of a direct preſentation is the ſame as that of any other annuity for life, and is found for 1l. by the table; which being multiplied by the yearly incomes, gives the value ſought.

PROB. 5. To find the value of a reverſion for ever, after two ſucceſſive lives; or to find the value of a living after the death of the preſent incumbent and his ſucceſſor.

RULE. By Prob. 3, find the value of the longeſt of the two lives, and ſubtract that value from the value of the perpetuity, and the remainder will be the value ſought.

EXAMP. A, aged 50, enjoys an eſtate or living of 100l *per annum*; B, aged 30, is intitled to his life time of the ſame eſtate after A's death; and it is propoſed to ſell the eſtate juſt now, with the burden of A and B's lives on it: What is the reverſion worth, reckoning intereſt at 4 *per cent.*?

	L.
By the table, A's life of 50 is . .	11.34
B's life of 30 is . .	14.68
Sum,	26.02
Value of their joint lives, found by Prob. 2. Caſe 2. is	8.60
Value of the longeſt life, ...	17.42 ſub.
From the value of the perpetuity,	25.00
Remains the value of 1l. reverſion,	7.58
Multiplied by	100
Value of the reverſion, ...	758.00

PROB. 6. To find the value of the joint continuance of three lives, one life failing, the annuity to ceaſe.

RULE. Find the ſingle values of the three lives from the table; multiply theſe ſingle values continually, calling the reſult the product of the three lives; multiply that product by the intereſt of 1l. and that product again by 2, calling the reſult the double product; then, from the ſum of the ſeveral products of the lives, taken two and two, ſubtract the double product; divide the product of the three lives by the remainder, and the quot will be the value of the three joint lives.

EXAMP. A is 18 years of age, B 34, and C 56: What is the value of their joint lives, reckoning intereſt at 4 *per cent.*?

By the table, the value of A's life is 16.1, of B's 14.12, and of C's 10.01.

16.1 × 14.12 × 10.05 = 2275.6, product of the three lives.

.04

91.024

2

182.048, double product.

Product of A and B, 16.1 × 14.12 × 227.33	
A and C, 16.1 × 10.02 = 161.16	
B and C, 14.12 × 10.00 = 141.34	
Sum of all, two and two, . . .	529.83
Double product ſubtract, . . .	182.048
Remainder, . .	347.782

And 347.782)2275.600(6.54 value ſought.

PROB. 7. To find the value of an annuity upon the longeſt of three lives.

RULE. From the ſum of the values of the three ſingle lives taken from the table, ſubtract the ſum of all the joint lives, taken two and two, as found by Prob. 2. and to the remainder add the value of the three joint lives, as found by Prob. 6. and that ſum will be the value of the longeſt life ſought.

EXAMP. A is 18 years of age, B 34, and C 56: What is the value of the longeſt of theſe three lives, intereſt at 4 *per cent.*?

By the table, the ſingle value of A's life is	16.1
ſingle value of B's life is	14.12
ſingl value of C's life is	10.01
Sum of the ſingle values,	40.23
By Prob. 2. the joint value of A and B is	10.76
joint value of A and C is	8.19
joint value of B and C is	7.65
Sum of the joint lives,	26.60
Remainder, ...	13.63
By Prob. 6. the value of the 3 joint lives is	6.54
Value of the longeſt of the 3 lives . .	20.17

The reader probably may wiſh that the reaſons of the rules, which, it muſt be owned, are intricate, had been aſſigned; but this could not be done without entering deeper into the doctrine of chances than would be proper in this place. See CHANCES. The preceding problems are ſufficient

cient for moſt purpoſes, and thoſe who wiſh to ſee more on this ſubject may conſult the writings of De Moivre, Simpſon, Dodſon, Dr Price, Morgan, &c. as well as ſome papers in the Philoſophical Tranſactions, Vol. LXVI. p. 109.

SECT. III. LIFE ANNUITIES *for* SCOTLAND.

WE would not do juſtice to our own country and climate, were we to conclude this ſubject, without taking notice, that Mr DAVID WILKIE, miniſter of Cults, (and author of a work, "On the theory of intereſt, ſimple and compound, derived from firſt principles, and applied to annuities," &c.) has conſtructed a table, which is thought by many to anſwer better for SCOTLAND than any yet publiſhed. Although only formed for the county of FIFE, from the bills of mortality which have been accurately kept in the pariſh of KETTLE, it has been found to agree with the lives of the miniſters of Scotland at large, as well as of their widows.

Suppoſing their mean age of ordination and of widowhood, to be reſpectively, 30 and 48 years. At 30 years of age, 22.27 years = a miniſter's expectation of life. At 48 years of age, 19.44 years = widow's expectation of life; which laſt, multiplied by 19.3, the number of widows left yearly, produces 375.2 = maximum of annuitants upon the widows ſettee. It has alſo been found to agree almoſt exactly with the proportion of births and deaths in 36 pariſhes of Scotland, taken at random, as recorded in the 1ſt vol. of Sir John Sinclair's Statiſtical Account, although ſituated in different counties, widely remote from each other.

From theſe pariſh records, it appears, there are 46,625 ſouls in theſe pariſhes; the mean number of births and deaths is 1156. Hence $\frac{46625}{1156} = 40.3$, the expectation of an infant's life in theſe 36 pariſhes; which agrees almoſt exactly with the ſame expectation by Mr Wilkie's table. Many of theſe pariſhes are in different counties, and ſituated widely remote from each other. That gentleman's table differs materially from all the Engliſh tables publiſhed on this ſubject. For inſtance,

By Mr WILKIE'S TAB.	*By* Dr HALLEY'S TAB.
$\frac{1}{35}$ of infants die the 1ſt year.	$\frac{1}{8}$ of infants die the 1ſt year.
$\frac{1}{36}$ die the 2d year.	$\frac{1}{9}$ die the 2d year.
Expectation of an infant's life = 40.6 years.	Expectation of an infant's life = 28 years.
Greateſt value of a life at 4 per cent. correſponding to 5 years of age = 18.1.	Greateſt value of a life at 4 per cent. correſponding to 10 years of age = 16.4.

The following TABLE *of the* PROBABILITIES *of* LIFE, which has been drawn up from the bills of mortality of the pariſh of Torthorwald, in the county of Dumfries, for 27 years, from 1764 to 1790, ſeems alſo to merit the attention of the public, in this country at leaſt.

TABLE VI.

Age.	Livg.	Dead.	Age.	Livg.	Dead.	Age.	Livg.	Dead.	Age.	Livg.	Dead.
0	280	32	24	204	1	48	169	2	72	88	6
1	248	10	25	203	1	49	167	2	73	82	7
2	238	2	26	202	1	50	165	2	74	75	7
3	236	2	27	201	1	51	163	2	75	68	7
4	234	2	28	200	1	52	161	2	76	61	7
5	232	2	29	199	1	53	159	2	77	54	6
6	230	2	30	198	1	54	157	2	78	48	6
7	228	2	31	197	1	55	155	2	79	42	5
8	226	1	32	196	1	56	153	2	80	37	4
9	225	1	33	195	1	57	151	3	81	33	3
10	224	1	34	194	1	58	148	3	82	30	3
11	223	1	35	193	1	59	145	3	83	27	3
12	222	1	36	192	1	60	142	4	84	24	3
13	221	1	37	191	2	61	138	4	85	21	3
14	220	2	38	189	2	62	134	4	86	18	3
15	218	2	39	187	2	63	130	4	87	15	3
16	216	2	40	185	2	64	126	4	88	12	3
17	214	2	41	183	2	65	122	4	89	9	2
18	212	2	42	181	2	66	118	4	90	7	2
19	210	2	43	179	2	67	114	4	91	5	1
20	208	1	44	177	2	68	110	5	92	4	1
21	207	1	45	175	2	69	105	5	93	3	1
22	206	1	46	173	2	70	100	6	94	2	1
23	205	1	47	171	2	71	94	6	95	1	1

By this table, the number of inhabitants is to that of births or burials, as 14040—140 is to 280, that is, as 49.64 is to 1. And the expectation of life, by the above table, is as follows:

Age	Expec	Age.	Expec.	Age.	Expec.	Age.	Expec.
0	49.64	25	41.14	50	22.26	75	7.1[illegible]
5	54.9	30	37.11	55	18.54	80	6.2[illegible]
10	51.57	35	33.01	60	14.98	85	4.[illegible]2
15	47.90	40	29.31	65	12.03	90	2.64
20	45.09	45	25.85	70	9.10	95	0.5[illegible]

The moſt valuable age by this table, is that of 2 years old, when a child's expectation of life is 56 years and one 4th, which is exceedingly high, and can only be applied to a country diſtrict in Scotland.

The above table of the probabilities of life, however, affords a ſtriking evidence, that Engliſh or foreign tables of obſervation do not correſpond with Scottiſh lives;—ſeeing by theſe, the expectation of infancy does not exceed 2[illegible] or at moſt 3 years, whereas here it wants but a trifle of 50. And if the value of life were computed by the above table, at a given rate of intereſt, the difference would alſo be conſiderable, which would ſtill increaſe, did the practice of inoculation every where prevail. Hence, a table of equal decrements, conſtructed upon the ſuppoſition, that 91 is the utmoſt extent of human life, would be better adapted to SCOTTISH LIVES, than M. de Moivre's hypotheſis, wherein that extent is fixed at 86 years.

(r.) ANNUITIES, GOVERNMENT. Borrowing upon annuities is one of the methods employed by government for raiſing ſupplies. Of this there are two methods; that of borrowing upon annuities for terms of years, and that of borrowing upon annuities for lives.

(s.) ANNUITIES, GOVERNMENT, HISTORY OF. During the reigns of king William and queen Anne, large ſums were frequently borrowed upon annuities for terms of years, which were ſometimes longer and ſometimes ſhorter. In 1693, an act was paſſed for borrowing one million upon an annuity of 14 *per cent.*, or of 140,000 l. a year for 16 years. In 1691, an act was paſſed for borrowing a million upon annuities for lives, upon terms ſuch in the preſent times would appear very advantageous. But the ſubſcription was not filled up. In the following year the deficiency was made good by borrowing upon annuities for lives at 14 *per cent.*, or at little more than ſeven years purchaſe. In 1695, the perſons who had purchaſed thoſe annuities were allowed to exchange them for others of 96 years, upon paying into the exchequer 63 pounds in the hundred; that is, the difference between 14 *per cent.* for life, and 14 *per cent.* for 96 years, was ſold for 63 pounds, or for four and a half years purchaſe. Such was the ſuppoſed inability of government, that even theſe terms procured few purchaſers. In the reign of queen Anne, money was upon different occaſions borrowed both upon annuities for lives and upon annuities for terms of 32, of 89, of 98, and of 99 years. In 1719, the proprietors of the annuities for 32 years were induced to accept in lieu of them South Sea ſtock to the amount of eleven and a half years purchaſe of the annuities, together with an additional quantity of ſtock equal to the arrears which happened then to be due upon them. In 1720, the greater part of the other annuities for terms of years both long and ſhort were ſubſcribed into the ſame fund. The long annuities at that time amounted to 666,821 l. 8 s. 3½d. a year. On the 5th of January, 1775, the remainder of them, or what was not ſubſcribed at that time, amounted only to 136,453 l. 12s. 8d. During the two wars which began in 1739 and in 1755, little money was borrowed either upon annuities for terms of years, or upon thoſe for lives.

(t.) ANNUITIES, GOVERNMENT, VALUE OF. An annuity for 98 or 99 years, however, is worth nearly as much money as a perpetuity, and ſhould, therefore, one might think, be a fund for borrowing nearly as much. But thoſe who, in order to make family ſettlements, and to provide for remote futurity, buy into the public ſtocks, would not care to purchaſe into one of which the value was continually diminiſhing; and ſuch people make a very conſiderable proportion both of the proprietors and purchaſers of ſtock. An annuity for a long term of years, therefore, though its intrinſic value may be very nearly the ſame with that of a perpetual annuity, will not find nearly the ſame number of purchaſers. The ſubſcribers to a new loan, who mean generally to ſell their ſubſcription as ſoon as poſſible, prefer greatly a perpetual annuity redeemable by parliament, to an irredeemable annuity for a long term of years of only equal amount. The value of the former may be ſuppoſed always the ſame, or very nearly the ſame; and it makes, therefore, a more convenient transferable ſtock than the latter. During the two laſt mentioned wars, annuities, either for terms of years or for lives, were ſeldom granted but as premiums to the ſubſcribers to a new loan, over and above the redeemable annuity or intereſt upon the credit of which the loan was ſuppoſed to be made. They were granted, not as the proper fund upon which the money was borrowed; but as an additional encouragement to the lender. Annuities for lives have occaſionally been granted in two different ways; either upon ſeparate lives, or upon lots of lives, which in French are called *Tontines*, from the name of their inventor. When annuities are granted upon ſeparate lives, the death of every individual annuitant diſburthens the public revenue ſo far as it was affected by his annuity. When annuities are granted upon tontines, the liberation of the public revenue does not commence till the death of all the annuitants comprehended in one lot, which may ſometimes conſiſt of twenty or thirty perſons, of whom the ſurvivors ſucceed to the annuities of all thoſe who die before them; the laſt ſurvivor ſucceeding to the annuities of the whole lot. Upon the ſame revenue more money can be raiſed by tontines than by annuities for ſeparate lives. An annuity, with a right of ſurvivorſhip, is really worth more than an equal annuity for a ſeparate life, and from the confidence which every man naturally has in his own good fortune, the principle upon which is founded the ſucceſs of all lotteries, ſuch an annuity generally ſells for ſomething more than it is worth. In countries where it is uſual for government to raiſe money by granting annuities, tontines are upon this account generally preferred to annuities for ſeparate lives. The expedient which will raiſe moſt money, is almoſt always preferred to that which is likely to bring about in the ſpeedieſt manner the liberation of the public revenue. In France, before the late revolution, a much greater proportion of the public debts conſiſted in annuities for lives than in England. According to a memoir preſented by the parliament of Bourdeaux to the king in 1764, the whole public debt of France was eſtimated at 2400 millions of livres; of which the capital, (for which annuities for lives has been granted,) was ſuppoſed to amount to 300 millions, the 8th part of the whole public debt. The annuities themſelves were computed to amount to 30 millions a year, the 4th part of 120 millions, the ſuppoſed intereſt of that whole debt. It was not the different degrees of anxiety in the two governments of France and England for the liberation of the public revenue, which occaſioned this difference in their reſpective modes of borrowing; it aroſe altogether from the different views and intereſts of the lenders. In the former, the money lenders were, in general, either court bankers, farmers general, or tax gatherers, who, from a mean origin, had riſen to great riches, and who, being too proud to marry their equals or inferiors, were deſpiſed by thoſe haughty nobleſſe, (who conſidered themſelves as their ſuperiors) and therefore reſolved to live bachelors. To ſuch perſons, who had no proſpect of, or care for poſterity, nothing was more convenient than to ex-

change their capital for a revenue, that would laſt juſt as long and no longer than they wiſhed. But in Britain, the ſeat of government being in the greateſt mercantile city in the world, the merchants are generally the people who advance money to government. By advancing it they do not mean to diminiſh, but, on the contrary, to increaſe their mercantile capitals; and unleſs they expected to ſell with ſome profit their ſhare in the ſubſcription for a new loan, they never would ſubſcribe. But if by advancing their money they were to purchaſe, inſtead of perpetual annuities, annuities for lives only, whether their own or thoſe of other people, they would not always be ſo likely to ſell them with a profit. Annuities upon their own lives they would always ſell with loſs; becauſe no man will give for an annuity upon the life of another whoſe age and ſtate are nearly the ſame with his own, the ſame price which he would give for one upon his own. An annuity upon the life of a third perſon, indeed, is, no doubt, of equal value to the buyer and the ſeller; but its real value begins to diminiſh from the moment it is granted, and continues to do ſo more and more as long as it ſubſiſts. It can never, therefore, make ſo convenient a transferable ſtock as a perpetual annuity, of which the real value may be ſuppoſed always the ſame, or very nearly the ſame.

* ANNUITY. *n. ſ.* [*annuité*, Fr.] 1. A yearly rent to be paid for term of life or years. The differences between a rent and an *annuity* are, that every rent is going out of land; but an *annuity* charges only the granter, or his heirs, that have aſſets by deſcent. The ſecond difference is, that, for the recovery of an *annuity*, no action lies, but only the writ of *annuity* againſt the granter, his heirs, or ſucceſſors; but of a rent, the ſame actions lie as do of land. The third difference is, that an *annuity* is never taken for aſſets, becauſe it is no freehold in law; nor ſhall be put in execution upon a ſtatute merchant, ſtatute ſtaple, or elegit, as a rent may. *Cowel.* 2. A yearly allowance.—He was generally known to be the ſon of one earl, and brother to another, who ſupplied his expence, beyond what his *annuity* from his father would bear. *Clarendon.*

ANNUITY OF TIENDS, in Scots law, a certain proportion of the tiends of erected benefices formerly payable to the crown, but now gone into diſuſe.

* *To* ANNUL. *v. a.* [from *nullus.*] 1. To make void; to nullify; to abrogate; to aboliſh.—That which gives force to the law, is the authority that enacts it; and whoever deſtroys this authority, does, in effect, *annul* the law. *Rogers.* 2. To reduce to nothing; to obliterate.—

Light, the pure work of God, to me's extinct.
And all her various objects of delight
Annull'd, which might in part my grief have eas'd. *Milton.*

* ANNULAR. *adj.* [from *annulus*, Latin.] In the form of a ring.—That they might not, in bending the arm or leg, riſe up, he has tied them to the bones by *annular* ligaments. *Cheyne.*

ANNULAR CARTILAGE, the ſecond cartilage of the larynx, being round, and inveſting the whole larynx; called alſo *cricoides.*

ANNULAR FINGER, the fourth, or ring finger.

ANNULAR LIGAMENT, a ſtrong ligament, encompaſſing the wriſt; after the manner of a bracelet; alſo the ligament of the tarſus. The ſphincter muſcle of the *anus* is alſo called *annularis*, or *annular* muſcle, from its figure.

ANNULAR PROCESS, a proceſs of the Medulla oblongata; ſo called by Dr Willis, becauſe it ſurrounds the ſame much like a ring.

* ANNULARY. *adj.* [from *annulus*, Lat.] In the form of rings.—Becauſe continual reſpiration is neceſſary, the wind-pipe is made with *annulary* cartilages, that the ſides of it may not flag and fall together. *Ray.*

ANNULATA, in Zoology. See COLUBER.

(1.) * ANNULET. *n. ſ.* [from *annulus*, Lat.] 1. A little ring. 2. [In heraldry.] A difference or mark of diſtinction, which the fifth brother of any family ought to bear in his coat of arms. *Annulets* are alſo a part of the coat-armour of ſeveral families; they were anciently reputed a mark of nobility and juriſdiction, it being the cuſtom of prelates to receive their inveſtiture *per baculum & annulum.* 4. [In architecture.] The ſmall ſquare members in the Dorick capital, under the quarter round, are called *annulets.* 5. *Annulet* is alſo uſed for a narrow flat moulding common to other parts of the column; ſo called, becauſe it encompaſſes the column round. *Chambers.*

(2.) ANNULET, in architecture, See § 1. It is the ſame member which Vitruvius calls a *fillet*; Palladio, a *liſtil* or *cincture*; Scammozi, and Mr Brown, a *ſupercilium*, *liſt*, *tinea*, *eye-brow*, *ſquare*, and *rabbit.*

(3.) ANNULET, in heraldry, See § 1. Among the Romans it repreſented liberty and nobility. It alſo denotes ſtrength and eternity, by reaſon of its circular form.

ANNULLING, [from *ad*, to, and *nullus*, none.] See *To* ANNUL.

ANNULUS, a ring, in geometry, the area of which is equal to the difference of the areas of the outer and inner circles: or it may be found by multiplying the ſum of their diameters by the difference, and the product by 7854.

* *To* ANNUMERATE. *v. a.* [*annumero*, Lat.] To add to a former number: to unite to ſomething before mentioned.

* ANNUMERATION. *n. ſ.* [*annumeratio*, Lat.] Addition to a former number.

ANNUNCIADA, or ANNUNTIATA, a denomination common to ſeveral orders, both religious and military; inſtituted with a view to the ANNUNCIATION. (See § 1, 2, & 3.) 1. A religious order, inſtituted in 1232, by 7 Florentine merchants, called *Servites*, q. d. *Servants.* 2. A nunnery at Bourges, founded by Joan, queen of France, after her divorce from Lewis XII. 3. A nunnery founded by a Genoeſe lady in 1600. 4. A friary, founded by cardinal Torrecremata, at Rome, in 1460; the managers of which are grown ſo very rich, that they give fortunes of ſixty Roman crowns to above 400 girls, on the anniverſary of the Annunciation. 5. The knights of the annuntiada, was a military order, inſtituted in 1362, by Amadeus VI. duke of Savoy; in memory of Amadeus I. who defended the iſle of Rhodes againſt the Turks. It was at firſt called the order of the True Lovers Knots; in memory of a bracelet of hair preſented to the founder by a lady; but, upon

on the election of Amadeus VIII. to the pontificate, its name was changed for that of the *Annunciada*, in 1434. The great collar of the order, which the knights wear on public occasions weighs 200 crowns of gold, and the motto engraved on it, is *F. E. R. T.* signifying *Fortitudo ejus Rhodum tenuit.*

* *To* ANNUNCIATE. *v. a.* [*annuncio*, Lat.] To bring tidings; to relate something that has fallen out: a word not in popular use.

(1.) ANNUNCIATION. [*ad* to, and *nuncio*, I declare,] the tidings which the angel Gabriel brought to the Virgin Mary of the incarnation of our Saviour. The Greeks call it *ευαγγελισμος, good tidings*; and *χαιρετισμος, salutation.*

(2.) * ANNUNCIATION DAY. *n. s.* [from *annunciate*] The day celebrated by the church, in memory of the angel's salutation of the blessed virgin; solemnized with us on the twenty-fifth of March.—Upon the day of *annunciation*, or Lady-day, meditate on the incarnation of our blessed Saviour: and so upon the festivals of the year. *Taylor.*

(3.) ANNUNCIATION, HISTORY OF THE FESTIVAL OF. (See § 2.) This festival appears to be of great antiquity. Mention is made of it in a sermon which goes under the name of Athanasius. Others carry it up to the time of Gregory Thaumaturgus, because there is a sermon likewise attributed to him upon the same subject. But the best critics reject both these writings as spurious. However, it is certain, this festival was observed before the time of the council of Trullo, in which there is a canon forbidding the celebration of all festivals in Lent, excepting the Lord's day, and the feast of the annunciation; so that we may date its original from the seventh century. In the Romish church, on this feast, the pope performs the ceremony of marrying or cloystering a certain number of maidens, who are presented to him in the church, clothed in white serge, and muffled up from head to foot: An officer stands by, with purses containing notes of 50 crowns for those who make choice of marriage, and notes of 100 for those who choose the veil! The eastern churches celebrate it at a different season from those of the West.—The Syrians call it *Bascarah*, q. d. *search, enquiry*; and mark it in the calendar for the first of December. The Armenians hold it on the 5th of January: thus anticipating the time to prevent its falling in Lent; but the Greeks make no scruple of celebrating the festival even in Lent.

(4.) ANNUNCIATION is also a title given by the Jews to part of the ceremony of their passover; viz. that, wherein they explain the origin and occasion of that solemnity. This explanation they call מגד, *Haggada*, q. d. the *Annunciation.*

ANNUNCIATOR, in the Greek Church, an officer whose business is to give notice of the feasts, and holy days to be observed.

ANNUS CLIMACTERICUS, the climacteric year, *i. e.* the 63d or the 81st year of a man's age, which in the days of superstition were reckoned critical, because the one consists of 7 times, and the other of 9 times 9!

ANO-CAPRI, the largest town in Capri, situated on the W. side of that island, belonging to Naples.

ANOCHUS, a medicine concerning which many fruitless conjectures have been made. The word occurs only in Gaza's translation of the account which Theophrastus has left us of the *Euonymus.* The author says, that the goats, which eat the leaves and fruit of the euonymus, died of a stoppage of the bowels, which he has expressed by the word *ανοχω*, derived from the verb *ανεχω*, which signifies a retention of the stools. But the euonymus of the Greeks could not be the same plant known at this time by that name, since the cattle eat our euonymos or *fusanus* wherever they can get it, without danger. The descriptions of these plants, in the ancient and modern authors, shew also that they were very different.

ANOCTORON, in ecclesiastical history, a name used by some writers for a church. Anoctora properly import Roman halls, many of which were converted into churches.

ANOCYSTI, in natural history, a class of the *echini marina*, which have an aperture of the anus at the top of the shell. Some of these approach to a hemisphere or spheroidal figure, others flatter and in shape somewhat resembling a shield.

ANODUS, among some chemical writers, a nutritious matter separated by the kidneys, different from urine.

(1.) * ANODYNE. *adj.* [from *α* and *οδυνη*.] That which has the power of mitigating pain.—

Yet durst the not too deeply probe the wound
As hoping still the nobler parts were sound:
But strove with *anodynes* t' assuage the smart,
And mildly thus her med'cine did impart.
Dryden.

—*Anodynes*, or abaters of pain of the alimentary kind, are such things as relax the tension of the affected nervous fibres, as decoctions of emoillent substances; those things which destroy the particular acrimony which occasions the pain, or what deadens the sensation of the brain, by procuring sleep. *Arbuthnot.*

(2.) ANODYNE, [from *α* privative, and *οδυνη pain*; a term applied to medicines which ease pain and procure sleep. They are divided into 3 sorts, viz. 1. Paregorics, or such as assuage pain. 2. Hypnotics, or such as relieve by procuring sleep. 4. Narcotics, or such as ease the patient by stupifying him. Opiates and narcotics taken too frequently, diminish sensation: in large doses they destroy life. In particular diseases, and in proper doses, they are excellent medicines. Some hypnotics and paregorics, as nitre, camphor, &c. procure ease and sleep by removing the offending cause. Camphor is said to be the best anodyne in nervous cases and at the decline of fevers. But opium properly administered is the best of anodynes excepting in cases where costiveness, a full habit, or the like, prohibit the use of it. The doses of all these medicines are generally regulated by the pulse. Anodynes should be given with great caution, and not on a full stomach, nor in dropsies. Hemlock procures ease and sleep, without causing that head-ach next morning, usually complained of after taking opium. Certain compound medicines in the shops are also prepared with this intention. Such is the anodyne balsam. See § 2. A ready way of preparing a useful, safe, and efficacious anodyne, is as follows: take half an ounce

of

of opium, diſſolve it in a gentle heat in 3 ounces of water, ſtrain the ſolution, and evaporate it to a dry ſubſtance. Grind this to powder in a glaſs mortar with twice the quantity of loaf ſugar, and of this preparation 3 or 4 grains may be given for a doſe. By diſſolving the opium thus in water, we get rid, not only of its groſs parts but alſo of its refinous, which are found more pernicious, than the reſt; and by dividing it afterwards and mixing it with ſugar, the medicine is rendered more uniform, ſoluble, and miſcible with animal fluids.

(3.) ANODYNE BALSAM is made of Caſtile ſoap, camphor, ſaffron, and ſpirit of wine, digeſted in a ſand heat. It is recommended not only for procuring eaſe in the moſt racking extremities of pain, but alſo for aſſiſting in diſcharging the peccant matters that occaſioned it. This balſam is much the ſame with the modern opodeldoc.

ANOIE. See ANEY.

* *To* ANOINT. *v. a.* [*oindre, enoindre;* part. *oint, enoint,* Fr.] 1. To rub over with unctuous matter, as oil, or unguents.—

Anointed let me be with deadly venom. *Shak.*

—Thou ſhalt have olive trees throughout all thy coaſts, but thou ſhalt not *anoint* thyſelf with the oil; for thine olive ſhall caſt his fruit. *Deut.* xxviii. 40. 2. To ſmear; to be rubbed upon.—

Warm waters then in brazen caldrons, borne,
Are pour'd to waſh his body, joint by joint,
And fragrant oils the ſtiffen'd limbs *anoint.*
Dryden.

3. To conſecrate by unction.—

I would not ſee thy ſiſter,
In this *anointed* fleſh ſtick boariſh fangs. *Shak.*

(1.) * ANOINTER. *n. ſ.* [from *anoint.*] The perſon that anoints.

(2.) ANOINTERS, a religious ſect in ſome parts of England, ſo called from the ceremony they uſed of anointing all perſons before they admitted them into their church. They founded their opinion of anointing upon the fifth of James, verſes 14 and 15.

ANOLE, in zoology, a ſpecies of lizard common in the Weſt Indies, about houſes and plantations. It is of the ſize of a common lizard of Europe, but its head is longer, its ſkin of a yelloviſh colour, and its back variegated with green, blue, and grey lines running from the neck to the tail. They creep into holes at night, and make a continual and very diſagreeble noiſe: in the day they are always in motion.

ANOLYMPIADES, in antiquity, a name given by the Elians to thoſe Olympic games which had been celebrated under the direction of the Piſæans and Arcadians. The Elians claimed the ſole right of managing the Olympic games, in which they ſometimes met with competitors. The civth Olympiad was celebrated by order of the Arcadians, by whom the Elians were at that time reduced very low: this, as well thoſe managed by the inhabitants of Piſa, they called ἀνολυμπιάδας, that is, "unlawful Olympiads;" and left them out of their annals, wherein the names of their victors and other occurrences were regiſtered.

* ANOMALISM. *n. ſ.* [from *anomaly.*] Anomaly; irregularity; deviation from the common rule. *Diſt.*

(1.) * ANOMALISTICAL. *adj.* [from *anomaly.*] Irregular; applied in aſtronomy to the year, taken for the time in which the earth paſſes through its orbit, diſtinct from the tropical year.

(2.) ANOMALISTICAL YEAR, in aſtronomy, is alſo called the *Periodical Year.* The ſpace of time belonging to this year is greater than the tropical year, on account of the proceſſion of the equinoxes. See ASTRONOMY.

(1.) * ANOMALOUS. *adj.* [ἀ *priv.* and ὁμαλὸς.] Irregular; out of rule; deviating from the general method or analogy of things: It is applied, in grammar, to words deviating from the common rules of inflection; and, in aſtronomy, to the ſeemingly irregular motions of the planets.—There will ariſe *anomalous* diſturbances, not only in civil and artificial, but alſo in military officers. *Brown's Vulgar Errours.*—He being acquainted with ſome characters of every ſpeech, you may at pleaſure make him underſtand *anomalous* pronunciation. *Holder.* Metals are gold, ſilver, copper, tin, lead and iron: to which we may join that *anomalous* body, quickſilver, or mercury. *Locke.*

(2.) ANOMALOUS NOUNS. In thoſe languages, wherein the nouns are declined by genders, numbers, and caſes, ſuch as the Greek and Latin, there are a vaſt number of anomalous nouns, which are either defective, redundant or variable, in one or other of theſe particulars. Thus *liberi* and *arma,* want the ſingular; *aer* and *ærum,* the plural; *chaos* wants the genitive; *ſuppetiæ* wants four caſes, and *ditis,* five: *cætera* wants the maſculine, *quiſquis,* the feminine, and *plus,* both: and *cælum* plural, *cæli,* and *locus, loci* or *loca,* are variable, and *materia, materies, æther, æthra,* &c. are redundant. But it is not in "inflexion," or declenſion alone, that nouns are anomalous. Adjectives are alſo frequently ſo in compariſon. Thus *bonus,* by the regular rule of compariſon, ſhould have *bonior, boniſſimus,* in the comparative and ſuperlative degrees: inſtead of which it has *melior* and *optimus.* The ſame adjective is equally anomalous in the Greek, as well as extremely redundant; ἀγαθὸς, having no fewer than ſeven comparatives, ἀμείνων, ἄρειων, βέλτιων, κρέσσων, κρείττων, λῶων, and χείρων: and four ſuperlatives, ἄριστος, βέλτιστος, κράτιστος, and λῶστος: all of which are completely anomalous in their formation. In the Engliſh language, which has neither genders nor caſes, the few anomalous nouns it has are only ſo in number and compariſon. Thus the ſubſtantive, *means* wants the ſingular, and *Sir* wants the plural. The adjectives, *good* and *evil,* inſtead of forming their comparatives and ſuperlatives, according to the uſual rule by adding *er* and *eſt,* (which would make *gooder, gooderſt, eviler, evilerſt,*) have the very irregular degrees of *better, beſt,* and *worſe, worſt.* The adjective, *little,* affords an inſtance of a double anomaly in its compariſon, being both irregular in the formation of its degrees, *leſs* and *leaſt,* and redundant, by having another comparative, *leſſer.*

(3.) ANOMALOUS VERBS, in grammar, ſuch as are not conjugated conformably to the paradigm of their conjugation. They are found in all languages. In Latin, the verb *lego* is the paradigm of the third conjugation; and runs thus *lego, legis, legit*: By the ſame rule *fero* ſhould be *ferls, ferit*:

fero

fero is therefore an anomalous verb. In Engliſh the irregularity relates often to the preterite tenſe and paſſive participle: for example, *give*, were it formed according to rule, would make *gived* in the preterite tenſe and paſſive participle; whereas, in the former, it makes *gave*, and in the latter *given*.

* ANOMALOUSLY. *adv.* [from *anomalous*.] Irregularly; in a manner contrary to rule.—Eve was not ſolemnly begotten, but ſuddenly framed, and *anomalouſly* proceeded from Adam. *Brown's Vulgar Errours.*

(I.) * ANOMALY. *n. ſ.* [*anomalie*, Fr. *anomalia*, Lat. ανωμαλία.] Irregularity; deviation from the common rule.—If we ſhould chance to find a mother debauching her daughter, as ſuch monſters have been ſeen, we muſt charge this upon a peculiar *anomaly* and baſeneſs of nature. *South.*—I do not purſue the many pſeudographies in uſe, but intend to ſhew how moſt of theſe *anomalies* in writing might be avoided, and better ſupplied. *Holder.*

(2.) ANOMALY, in aſtronomy, the diſtance of a planet from the *aphelion* or *apogee*; or an irregularity in its motion, whereby it deviates from the aphelion or apogee.

(3.) ANOMALY, in grammar, denotes an irregularity in the accidents of a word, in which it deviates from the common rules, whereby other words of the like kind are governed.

(I.) ANOMIA, in zoology, a genus of inſects belonging to the order of vermes teſtacea. The ſhell is bivalve, and the ſhells are unequal. One valve is perforated near the hinge; affixed by that perforation to ſome other body. There are 25 ſpecies of the anomia; of which only two are natives of the Britiſh ſeas, viz.

1. ANOMIA EPHIPPIUM, has the habit of an oyſter; the one ſide convex, the other flat; perforated; adherent to other bodies, often to oyſter-ſhells, by a ſtrong tendinous ligature. The colour of the inſide is perlaceous; the ſize, near two inches diameter.

2. ANOMIA SQUAMULA, with ſhells reſembling the ſcales of fiſh; very delicate, and ſilvery; much flatted; perforated, and very ſmall. It adheres to oyſters, crabs, lobſters, and ſhells. The ſpecies of this genus are commonly called *Beaked cockles*. No name has been given to the fiſh that inhabit it; for the recent ſhells of this kind are ſo very rare, that there is ſcarcely one to be found perfect. They are perhaps, as well as that which has given its form to the *cornu ammonis*, inhabitants of the deepeſt parts of the ocean; conſequently it muſt be ſome extraordinary agitation of that great body of water that can bring them at all to our knowledge in their recent ſtate.

(II.) ANOMIA, THE FOSSILE. Theſe are uncommonly numerous in this iſland, in our chalk pits and limeſtone quarries; and, in Glouceſterſhire, they are as common on the ploughed lands as pebbles in other places.

ANOMOEANS, in eccleſiaſtical hiſtory, the name by which the pure Arians were called in the 4th century, in contradiſtinction to the Semi-Arians. The word is formed from the Greek, ανωμοῖος, *diſſimilar*: For the pure Arians aſſerted, that the Son was of a nature different from, and in nothing like, that of the Father: whereas the Semi-Arians acknowledged a likeneſs of nature in the Son; at the ſame time that they denied, with the pure Arians, the conſubſtantiality of the Word.—The Semi-Arians condemned the Anomœans in the council of Seleucia; and the Anomœans in their turn condemned the Semi-Arians in the councils of Conſtantinople and Antioch, eraſing the word ομοιος, *like*, out of the Formula of Rimini and that of Conſtantinople.

ANOMORRHOMBOIDIA [from ανωμαλης, irregular, and ρομβοειδης, a rhomboidal figure,] in natural hiſtory, a genus of ſpars. The bodies of this genus are pellucid cryſtaline ſpars of no determination or regular external form, but always breaking into regularly rhomboidal maſſes; eaſily fiſſile, and compoſed of plates runing both horizontally and perpendicularly through the maſſes, but cleaving more readily and evenly in an horizontal, than in a perpendicular direction; the plates being ever compoſed of irregular arrangements of rhomboidal concretions. Of this genus there are five known ſpecies; viz. 1. A white, bright, and ſhattery one; found in great quantities in the lead mines of Derbyſhire, Yorkſhire, and Wales. 2. A milk-white opaque, and ſhattery one, found in ſome parts of France, and very plentifully in Germany, and ſometimes in Wales and Scotland, and in the hills of Yorkſhire. 3. A hard, dull, and ſnow white one, found in ſome of the mines in Derbyſhire, and in many of our northern countries. 4. A hard gray and pellucid one, found in the lead mines of Yorkſhire, and very common in Germany. And, 5. A pellucid and colourleſs one; this is found in the lead mines of Derbyſhire and Yorkſhire. All theſe in ſome degree have their double refraction of the ICELAND CRYSTAL, which ſee.

ANOMPHALOUS, [from α, privative, and ομφαλος, the navel,] without a navel; an epithet given to our firſt parents, who, it is ſuppoſed, were created without the umbilical cord, or any mark of it, having had no occaſion for nouriſhment in that manner.

* ANOMY. *n. ſ.* [α *priv.* and νομος.] Breach of law.—If ſin be good, and juſt, and lawful, it is no more evil, it is no ſin, no *anomy*. *Bramhall.*

* ANON. *adv.* [*Junius* imagines it to be an elliptical form of ſpeaking for *in one*, that is, *in one minute*; *Skinner* from *a* and *nean* or *near*; *Minſheu* from *on on*.] 1. Quickly; ſoon; in a ſhort time.—

However, witneſs, Heav'n!
Heav'n, witneſs thou *anon!* while we diſcharge
Freely our part. *Milton.*

—He was not without deſign at that preſent, as ſhall be made out *anon*; meaning by that device to withdraw himſelf. *Clar.*—

Still as I did the leaves inſpire,
With ſuch a purple light they ſhone,
As if they had been made of fire,
And ſpreading ſo, would flame *anon*. *Waller.*

2. Sometimes; now and then; at other times. In this ſenſe is uſed *ever and anon*, for now and then.—

Full forty days he paſs'd, whether on hill
Sometimes, *anon* in ſhady vale, each night,
Or harbour'd in one cave, is not reveal'd. *Milt.*

ANONIS, in botany. See ONONIS.

ANONYMAL. See ANONYMOUS, § 1.

ANONYMOS. See CHELONE.

(1.) * ANONYMOUS. *adj.* [*a priv.* and *ονομα.*] Wanting a name.—Theſe animalcules ſerve alſo for food to another *anonymous* inſect of the waters. *Ray.*—They would forthwith publiſh ſlanders unpuniſhed, the authors being *anonymous*, the immediate publiſhers thereof ſculking. *Notes on the Dunciad.*

(2.) ANONYMOUS, in anatomy, a name ſometimes given to parts newly diſcovered. The 2d cartilage of the throat, now called *cricoides*, or *annuliformis*, was anciently ſtiled *anonymous*.

(3.) ANONYMOUS, in commerce. Before the late revolution, partnerſhips in trade in France were ſtiled anonymous, when they were not carried on under any particular name, but wherein each of the partners traded viſibly on his own account, and in his own name; after which all the partners gave one another an account of their profit or loſs. Theſe ſorts of partnerſhips were known only to the parties themſelves. There was alſo another ſpecies of anonymous partnerſhips in France, wherein perſons of fortune and quality depoſited ſums of money, in order to ſhare the profit and loſs. Thoſe who furniſhed the capital had no trouble in carrying on the trade, nor did their names appear to be any way intereſted therein. But as it was the pride of the French *Nobleſſe* alone, which gave birth and ſupport to theſe anonymous partnerſhips, it is doubtful whether, under the preſent government, which recognizes none of the ancient nobility, any ſuch trade is carried on.

(4.) ANONYMOUS, in law. The ſending anonymous letters demanding money, &c. is felony by the Black Act, 9. Geo. I. cap. 22.

(5.) ANONYMOUS, in literature, is a term uſually applied to books, which do not expreſs the author's name, or to authors whoſe real names are unknown, ſuch as the celebrated *Letters of Junius*, &c.

(6) ANONYMOUS SPIRIT, in chemiſtry, a ſpirit extracted from tar and wood.

* ANONYMOUSLY. *adv.* [from *anonymous.*] Without a name—I would know, whether the edition is to come out *anonymouſly*, among complaints or ſpurious editions. *Swift.*

ANONYMUS. See ANONYMOUS, § 2.

(1.) * ANOREXY. *n. f.* [ανορεξια.] Inappetency, or loathing of food. *Quincy.*

(2.) ANOREXY, CAUSES AND CURE OF. ANOREXIA, from *a* neg. and *ορεξις*, appetite, is either original or ſymptomatic. When it is original, its cauſes are bad diet, too free drinking, voraciouſneſs, &c.: In which caſes, a vomit of ipecacuanha may be taken; after which temperance, a light but cordial nouriſhing diet, and daily exerciſe, perſiſted in, will generally effect a recovery. But it is more frequently a ſymptom of ſome other diſorder; and then the cure depends on the removal of the original one.

(1.) ANOSSI, GEOGRAPHY, AND NATURAL HISTORY OF. A province of the iſland of Madagaſcar, lying between Lat. 23. 18. and 26. S. It is watered by many rivers, moſt of which run into the *Franchere*, *Ramevatte*, or *Immour*, the ſpring of which is in a mountain called *Mangbage*, and diſcharges itſelf into the ſea in Lat. 25. 18. S. The mouth of this river is often ſtopped, and the courſe to the ſea interrupted, unleſs kept open by the overflowings of great rains and high tides. The water runs ſalt one league above the mouth, particularly in a free communication with the ſea. A lake, called *Ambou*, is formed at the mouth, half a league wide, with depth ſufficient for any ſhip if the mouth of the river was kept open. Next in bigneſs to the Franchere is the Manghaſia, which ſprings from a mountain called *Siliva*, and empties itſelf into the ſea, where large ſhips may ride at anchor. Crocodiles breed in theſe and all the other rivers of the iſland. Between the two rivers above mentioned lies Cape St Romain, half a mile diſtant from the mouth of the Franchere, and which runs from the NW. 6 or 7 leagues into the ſea. When the Cape is paſſed, the coaſt forms a great bay, in the ſhape of a croſs, which extends to the mouth of a river called *Dian Panouge*, or *Pitorah*. In the middle of this bay the land runs out, and almoſt forms a peninſula, called *Tholangare*. Fort Dauphin lies to the N. of this peninſula, and Port Dauphin over againſt it. This province has ſeveral other peninſulas and ſmall iſlands belonging to it. The country is beautiful; abounds in fruit trees; is fertile in paſtures for cattle; and, if carefully cultivated, would produce all the neceſſaries of life. It is ſurrounded by high mountains, which are covered with woods and ſhrubs; but, about four miles diſtant from Fort Dauphin, the adjacent hills are quite deſtitute of verdure. The French often dug in this neighbourhood, expecting to meet with mines of gold and ſilver, particularly in one mountain where ſeveral ſprings flow near each other and empty themſelves into a neighbouring river. In this river they found ſeveral ſtones and heaps intermixed with yellow clay, with a great quantity of black and white ſpangles ſhining like ſilver, which they carefully pounded and waſhed, but without effect. About 30 yards above theſe ſprings, the graſs, and every ſort of vegetable, appears half dried and yellow, from a metalline ſulphur, which gives that aſpect; but the top of the mountain is covered with a freſh and beautiful verdure. It is ſaid that the Portugueſe found gold at the foot of this mountain on the N. ſide, but that the place they had dug was filled up by the chiefs of the country after the Portugueſe had been driven out.

(2.) ANOSSI, INHABITANTS, RANKS, CUSTOMS, &c. OF. Anoſſi is inhabited by three different ſorts of whites, and four ſorts of negroes. The whites are diſtinguiſhed by the names of Rohandrians, Anacandrians, and Ondzatſi. The whites are diſtinguiſhed from the negroes, by the general name of Zaferamini, or Rahimini; and the Rohandrians are diſtinguiſhed above the other whites. When they proceed to an election of a ſovereign, whom they call Ompiandrian, or Dian Bahouache; he is choſen from the Rohandrian race. Next to him, the others hold the rank of princes, and are honoured as ſuch, by all the reſt of the ſubjects. The Anacandrians are deſcendants of the chiefs, but who have degenerated, and are accounted the baſtards of princes, or

thoſe

those who are descended from a Rohandrian, and any inferior white or black woman. These are likewise called by the name of Ontempassemaca, or people from the sandy parts of Mecca, from whence, they say, came the Rohandrians. Both the Rohandrians and Anacandrians wear long hair, which hangs down in curls; and enjoy the privilege of killing beasts. The Ondzatsi, or lowest class of whites, are descended from the bastards of the Anacandrians. These are all fishermen, and are allowed to kill no land animal, except a chicken. The four classes of negroes are named Voadziri, Lohavohits, Ontsoa, and Ondeves.—The Voadziri, the most powerful, and the richest, are masters of several villages, and descended from the original lords of the country. They enjoy the privilege of killing beasts, when at a distance from the whites, and no Rohandrian or Anacandrian in the village. The Lohavohits are descendants from the Voadziri, and also lords; but with this difference, that the one commands a whole district, and the jurisdiction of the others extends only to their own village and family.—They are also permitted to kill those beasts they intend to eat, when at a distance from the whites. The Ontsoa are next to the Lohavohits, and are their near relations. The Ondeves are the lowest of all, being originally slaves by father and mother. The Voadziri, Lohavohits, and Ontsoa, enjoy the *privilege* of submitting themselves, on the death of their lord or king, to any chief they please. In return for such homage, the new lord makes them a present, in consequence of which, he becomes heir of all their possessions. Hence the lower classes, both of whites and blacks, when death approaches, are under the greatest anguish of mind, knowing that their lords will not fail to deprive their children of every thing they possess. The Ondeves have not the same liberty with the others: but, in times of famine, the chiefs are obliged to supply them with necessaries; which, if they fail to do, they have the liberty of submitting themselves to new masters.

(3.) ANOSSI, SUPERSTITIONS, HISTORY, &c. or. The inhabitants of this province have no temples, and very little appearance of religion; only they keep up a custom of immolating beasts upon particular occasions, as in sickness, planting yams or rice, on assemblies, &c. They offer the first born beast to the devil, and to God, naming the devil first, in this manner, *Dianbilis Aminhanahare*, or Lord Devil and God. There are several towns on the river Franchere; and near this river the Portuguese had a fort built upon a steep rock, and several buildings below, with enclosures, which furnished all sorts of necessaries for their subsistence; but they were all massacred by the natives. This province seems originally to have been inhabited by negroes. The whites or Zaferamini settled in it about 200 years ago, and conquered the negroes. But they themselves were conquered by the French, though under the government of a king, whom they honoured as a god. In 1642, Captain Rivault obtained a permission to establish a colony in this part of the island; and accordingly, he took possession of it in the name of the king of France, in September, that year. The French landed 200 men, well armed, and provided with store of ammunition and other necessaries for building a fort, which they immediately set about; but no sooner did the natives observe their intention, than they used their utmost art to prevent their design from taking effect. This created a war, in which the French were victors; and, the natives becoming in time much better reconciled to them, they intermarried, and lived in several towns at some distance from one another, not above five or six in a place. This tranquillity lasted for some years; but at last, the natives growing jealous, resolved to free themselves from a foreign yoke, and accordingly formed a conspiracy to cut off all the French in one day; which they soon after effected, not leaving a single person alive. In 1644, the above mentioned Fort Dauphin was erected, in Lat. 25. 6. S. Many buildings were erected, behind the Fort, adjoining to the governor's house, with great inclosures that produced every sort of fruit and kitchen herb. In 1656, this fort was accidentally destroyed by fire; but was soon after repaired, and still continues, notwithstanding the catastrophe above mentioned; and its garrison carries on frequent wars with the natives.

* ANOTHER. *adj.* [from *an* and *other*.] 1. Not the same.—He that will not lay a foundation for perpetual disorder, must of necessity find *another* rise of government than that. *Locke.* 2. One more; a new addition to the former number.—

———A fourth?———

What! will the line stretch out to th' crack of drum?

Another?—a seventh! I'll see no more.

Shakespeare.

3. Any other; any one else.—If one man sin against *another*, the judge shall judge him. 1 *Samuel*, ii. 25.—

Why not of her? preferr'd above the rest,
By him with knightly deeds, and open love, profess'd:
So had *another* been, where he his vows address'd. *Dryden.*

4. Not one's self.—A man shall not have diffused his life, his self, and his whole concernments so far, that he can weep his sorrows with *another's* eyes; when he has another heart besides his own, both to share and to support his grief. *South.* 5. Widely different; much altered.—When the soul is beaten from its station, and the mounds of virtue are broken down, it becomes quite *another* thing from what it was before. *South.*

* ANOTHERGAINES. *adj.* [See ANOTHER-GUESS.] Of another kind. This word I have found only in *Sidney*.—If my father had not plaid the hasty fool, I might have had *anothergains* husband than Dametas. *Sidney.*

* ANOTHERGUESS. *adj.* [This word, which, though rarely used in writing, is somewhat frequent in colloquial language, I conceive to be corrupted from *another guise*; that is, of a different *guise*, or manner, or form.] Of a different kind.—Oh Hocus! where art thou? It used to go in *anotherguess* manner in thy time. *Arbuthnot.*

ANOTTA, ANNOTTO, or ARNOTTA, in dyeing, an elegant red colour, formed from the pel-

licles or pulp of the ſeeds of the BIXA, a tree common in South America. It is alſo called *Terra Orleana*, and *Roucou*. The manner of making anotta is as follows: The red ſeeds, cleared from the pods, are ſteeped in water, for 7 or 8 days or longer, till the liquor begins to ferment; then ſtrongly ſtirred, ſtamped with wooden paddles and beaters, to promote the ſeparation of the red ſkins: this proceſs is repeated ſeveral times, till the ſeeds are left white. The liquor, paſſed through cloſe cane ſieves, is pretty thick, of a deep red colour, and a very ill ſmell; in boiling, it throws up its colouring matter to the ſurface in form of ſcum, which is afterwards boiled down by itſelf, to a due conſiſtence, and made up while ſoft, into balls. The anotta uſed among us, is moderately hard and dry, of a brown colour on the outſide, and a dull red within. It is difficultly acted upon by water, and tinges the liquor only of a pale browniſh yellow colour. In rectified ſpirit of wine, it very readily diſſolves, and communicates a high orange or yellowiſh red.—Hence it is uſed as an ingredient in varniſhes, for giving more or leſs of an orange colour to the ſimple yellows. Alkaline ſalts render it perfectly ſoluble in boiling water, without altering its colour. Wool or ſilk boiled in the ſolution acquire a deep, but not a very durable, orange dye. Its colour is not changed by alum or by acids, any more than by alkalis: but, when imbibed in cloth, it is diſcharged by ſoap, and deſtroyed by expoſure to the air. It is ſaid to be an antidote to the poiſonous juice of manioc or caſſava. Labat informs us, that the Indians prepare an anotta, greatly ſuperior to that which is brought to us, of a bright ſhining red colour almoſt equal to carmine; that, for this purpoſe, inſtead of ſteeping and fermenting the ſeeds in water, they rub them with the hands, previouſly dipt in oil, till the pellicles come off, and are reduced into a clear paſte; which is ſcraped off from the hands with a knife, and laid on a clean leaf in the ſhade to dry. De Laet, in his notes on Margrave's natural hiſtory of Brazil, mentions alſo two kinds of anotta; one of a permanent crimſon colour, uſed as a fucus or paint for the face; and another which gives a colour inclining more to that of ſaffron. This laſt, which is our anotta, he ſuppoſes to be a mixture of the firſt ſort with certain reſinous matters, and with the juice of the root of the tree. The wax or pulp in which the ſeeds are incloſed is a cool, agreeable, rich cordial, and has been long in uſe among the Indians and Spaniards in America, who ſtill mix it with their chocolate, both to heighten the flavour, and raiſe the colour. It is ſaid to be a ſucceſsful remedy in bloody fluxes. The roots have the ſame properties with the wax; but theſe are obſerved to work more powerfully by the urinary paſſages: they are uſed by ſome people among their broths, and anſwer all the purpoſes of the pulp, but in a more faint degree. The Glouceſter cheeſes are coloured with this dye. See BIXA.

ANOUT, a ſmall iſland in the Schagerrack, or that part of the ſea of Denmark, which has Norway on the N. Jutland on the W. and the iſle of Zealand on the S. Lon. 13. 0. E. Lat. 56. 36. N.

ANOWTHAM, a village in the county of Cornwall, near St Ives.

ANPITS, in the military art, in writers of the middle age, a breaſt work, or barbacan.

ANSÆ, or ANSES, in aſtronomy, implies the parts of Saturn's ring, projecting beyond the diſk of the planet. The word is Latin, and properly ſignifies *handles*; theſe parts of the ring appearing like handles to the body of the planet.

(1.) ANSARIANS, a people of Syria, ſo called in that country, but ſtyled in Deliſle's maps, *Enſarians*, and in thoſe of Danville, *Neſſarii*. The territory occupied by theſe Anſarians is that chain of mountains which extends from Antakia to the rivulet called *Nabr-el-Kabir*, or the Great River. The hiſtory of their origin is little known. The following account is taken from the *Bibliotheque Orientale* of Aſſemani, a writer who has drawn his materials from the beſt authorities. See § 2.

(2.) ANSARIANS, ORIGIN OF THE. "In the year of the Greeks 1202 (A. D. 891,) there lived at the village of Naſar, in the environs of Kouſa, an old man, who, from his faſtings, his continual prayers, and his poverty, paſſed for a ſaint: ſeveral of the common people declaring themſelves his partizans, he ſelected from among them 12 diſciples to propagate his doctrine. But the commandant of the place, alarmed at his proceedings, ſeized the old man, and confined him in priſon. In this ſituation, he excited the pity of a girl who was a ſlave to the gaoler, and ſhe determined to give him his liberty: an opportunity ſoon offered to effect her deſign. One day when the gaoler was gone to bed intoxicated, and in a profound ſleep, ſhe gently took the keys from under his pillow, and after opening the door to the old man, returned them to their place unperceived by her maſter: the next day when the gaoler went to viſit his priſoner, he was extremely aſtoniſhed at finding he had made his eſcape, as he could perceive no marks of violence. He therefore concluded he had been delivered by an angel, and ſpread the report, to avoid the reprehenſion he merited; the old man, on the other hand aſſerted the ſame thing to his diſciples, and preached his doctrines with more earneſtneſs than ever. He even wrote a book, in which, among other things, he ſays, 'I, ſuch a one, of the village of Naſar, have ſeen Chriſt; who is the word of God, who is Ahmad, ſon of Mohammed, ſon of Hanafa, of the race of Ali; who alſo is Gabriel: and he ſaid to me, Thou art he who readeth (with underſtanding;) thou art the man who ſpeaketh truth; thou art the camel which preſerveth the faithful from wrath; thou art the beaſt which carrieth their burden; thou art the (Holy) Spirit, and John, the ſon of Zachary! Go, and preach to men that they make 4 genuflections in praying; two before the riſing of the ſun, and two before his ſetting, turning their faces towards Jeruſalem: and let them ſay, three times, God Almighty! God Moſt High! God Moſt Great! Let them obſerve only the 2d and 3d feſtival; let them faſt but two days annually; let them not waſh the prepuce: nor drink beer, but as much wine as they think proper; and laſtly, let them abſtain from the fleſh of carniverous animals.

mals This old man paſſing into Syria, propagated his opinions among the lower orders of the country people, numbers of whom believed in him: And after a few years he went away, and nobody ever knew what became of him." From this account, the founder of the Anſarians appears to have been either a deliberate impoſtor, like Mahomet, or more probably a crazy enthuſiaſt like *Richard Brothers*, who took the dreams of a warm imagination, for realities. We cannot be ſurpriſed that theſe ignorant peaſants ſhould have believed in this enthuſiaſt, when we ſo lately found, that many people of our own enlightened age and nation, gave credit to the equally abſurd reveries of Richard!

(5.) ANSARIANS, RELIGIONS, &c. OF THE The Anſarians are divided into ſeveral tribes or ſects; among which are diſtinguiſhed the Shamſia, or adorers of the ſun; the Kelbia, or worſhippers of the dog; and the Kadmouſia, who are ſaid to pay a particular homage to that part in women which correſponds to the priapus. Many of the Anſarians believe in the metempſychoſis; others reject the immortality of the ſoul; and in general, in that civil and religious anarchy, that ignorance and rudeneſs which prevail among them, theſe peaſants adopt what opinions they think proper, following the ſect they like beſt, and frequently attaching themſelves to none. Their country is divided into three principal diſtricts farmed by the chiefs called *Mokaddamim*. Their tribute is paid to the Pacha of Tripoli, from whom they annually receive their title. Their mountains are in general not ſo ſteep as thoſe of Lebanon, and conſequently are better adapted to cultivation; but they are alſo more expoſed to the Turks, and hence doubtleſs, it happens, that with greater plenty of corn, tobacco, wines, and olives, they are more thinly inhabited than thoſe of their neighbours the MARONITES and the DRUZES; which ſee.

ANSARIUM, or ANSURIUM, in civil law, a duty on all proviſions carried in veſſels with *anſæ*, or handles.

* ANSATED. *adj.* [*anſatus*, Lat.] Having handles; or ſomething in the form of handles.

ANSATUM TELUM, a dart or javelin, with an *amentum* faſtened to it. ANSÆ of a javelin thoſe two eminences about the middle of the *cuſpis*, or point, which hinders the weapon from piercing through the whole body.

ANSCOTE, in our ancient law books, the ſame with ANHUOTE. See SCOT.

ANSE, an ancient town of France in the department of Rhone and Loire, 10 miles N. of Lyons, 25 S. by W. of Macon, and 10 W. of Trevoux. Lon. 4. 50. E. Lat. 45. 55. N.

ANSEDE, a diſtrict of Entre-duero-e-Minho.

ANSEL WEIGHT. See AUNCEL WEIGHT.

(1.) ANSELM, [*Hanſzhelm*, Teut. *i. e.* a defender of his companions,] archbiſhop of Canterbury, in the reigns of William I. and Henry I. born in 1033, at Aoſt, in Savoy. He became a monk in the abbey of Bec in Normandy; of which he was afterwards choſen prior, and then abbot. In 1092, he was invited over to England by Hugh Earl of Cheſter; and in 1093, was made archbiſhop of Canterbury. He enjoined celibacy on the clergy; for which he was baniſhed by William, but recalled by Henry at his coming to the crown. He refuſed to conſecrate biſhops inveſted by the king, flatly denying it to be the king's prerogative; for this he was again baniſhed; till, the pope and king agreeing, he was recalled in 1107. In ſhort, from the day of his conſecration to his death, he was continually employed in fighting for the prerogative of the church againſt that of the crown; and for that purpoſe ſpent much of his time in travelling backwards and forwards between England and Rome, for the advice and direction of the pope. At the council of Bari, in Naples, the pope being puzzled by the arguments of the Greeks againſt the Holy Ghoſt's proceeding from the Father, he called upon Anſelm, who was preſent, and he diſcuſſed their objections with great applauſe. The pope afterwards deſerted Anſelm, who went to Lyons, where he reſided till the death of William, when he returned to England, and was received with great reſpect; but a new rupture aroſe, by the archbiſhop refuſing to be reinveſted by the king; on which a reference was made to the pope, who decided in favour of Anſelm. This induced the nobility to adviſe the king to break abſolutely with the pope, in conſequence of which ſome of them were excommunicated. At length, the pope made a conceſſion, by allowing the Engliſh biſhops and abbots to do homage to the king for their temporalities, which reſtored Anſelm to favour. The prieſts call him a reſolute ſaint; to other people he appears to have been an obſtinate and inſolent prieſt. He wrought many miracles, if we believe the author of his life, both before and *after* his death, which happened at Canterbury, in the 76th year of his age, anno 1109. He was canoniſed in the reign of Henry VII. Anſelm, though we may diſregard him as a ſaint, deſerves to be remembered as one of the principal revivers of literature, after three centuries of profound ignorance. His works have been printed in different years, and at different places; but the beſt edition is that of father Gatheron, printed at Paris 1675. It is divided into 3 parts; the firſt contains dogmatical tracts, and is entitled *Monologia*; the 2d practical and devotional tracts; the 3d conſiſts of letters, in 4 books.

(2.) ANSELM of Parma, a celebrated magician, or rather juggling impoſtor, ſaid by Delrio, in his *Diſquiſitiones magicæ*, to have performed miraculous cures by what is called ST ANSELM'S ART, See § 3.

(3.) ANSELM'S ART, ST, a ſuperſtitious method of curing wounds, by merely touching the linen that covered them, reported by Delrio, to have been actually performed by ſome Italian ſoldiers, who aſcribed miraculous virtue to ST ANSELM, (§ 1.) and not to the magician!

(1) ANSER AMERICANUS, the TOUCAN.

(2.) ANSER, in aſtronomy, a ſmall ſtar, of the fifth or ſixth magnitude, in the milky way, between the ſwan and eagle, firſt brought into order by Hevelius.

(3.) ANSER, [Lat. the gooſe,] in ornithology, a ſpecies of anas. See ANAS, N° 4. § 1 and 2.

(4.) ANSERES, the name which Linnæus gives to his third order of birds. See ZOOLOGY.

ANSES. See ANSÆ.

ANSIBARII, or ANSIVARII, an ancient people of Germany, ſituated ſomewhere in the neighbourhood of the Chauci. All we know of their hiſtory is, that in the reign of Nero, they were driven from their own poſſeſſions by the Chauci. They then took poſſeſſion of ſome uninhabited lands, which had been uſed as paſture for the horſes of the Roman ſoldiers. They were led by one Boiocalus, a man of great valour, and of known fidelity to the Romans. He remonſtrated to the Romans, who objected to their taking poſſeſſion of theſe lands, That the territory in diſpute was large; and requeſted, that it might be allowed to an unhappy people, driven from their own habitations: that, at the ſame time, wide tracts might be retained for the horſes and cattle of the ſoldiers to graze in: that it was inconſiſtent with humanity to famiſh men in order to feed beaſts, &c. and at laſt lifting up his eyes to heaven, he aſked the celeſtial luminaries how they could behold a deſolate ſoil, and if they would not more juſtly let looſe the ſea to ſwallow up uſurpers, who had engroſſed the whole earth? To this the Roman commander, Avitus, replied, that the weakeſt muſt ſubmit to the ſtrongeſt; and that ſince the gods, to whom they had appealed, had left the ſovereign judgment to the Romans, they were reſolved to ſuffer no other judges than themſelves. To Boiocalus himſelf, however, he privately offered lands as a reward for his long attachment to the Romans: but this offer the brave German rejected, as a price for betraying his people; adding, "A place to *live* in we may want, but a place to *die* in we cannot." The Anſibarii now invited the neighbouring nations to join them againſt the Romans; but they, dreading the power of that nation, refuſed to give them any aſſiſtance: upon which they applied to the neighbouring nations, begging leave to ſettle in their territories; but being every where driven out as enemies and intruders, theſe unhappy people were reduced to wander up and down till every one of them periſhed.

ANSICANS, or ANSIKANS, } the inhabitants of Anſiko, are neat, well proportioned, and ſtrong; wandering about from place to place, without either ſowing or reaping. They are dreaded for their extreme brutality, and never traded with by the Europeans. They are equal to the Giagas in fierceneſs and barbarity. They are ſo accuſtomed to the eating of human fleſh, that it is aſſerted they have markets where it is publicly ſold, and that there are no other graves for the dead than the bellies of the living. They try the courage of their priſoners of war by ſhooting at them as at marks, directing their arrows above or around their heads; and whoever diſcovers the leaſt ſigns of fear is immediately devoured without mercy. Thoſe who appear intrepid and reſolute, have their noſes and ears bored, and two fore teeth of the upper jaw drawn. They are then improved in barbarity by accuſtoming them to the moſt horrid cruelties. The language of the Anſikans is barbarous, and difficult to be learned, even by the inhabitants of Congo. The moſt diſtinguiſhed among them wear red and black caps of Portugueſe velvet; the lower ranks go naked from the waiſt upwards; and to preſerve their health, anoint their bodies with a compoſition of pounded white ſandal wood and palm oil. Their arms are battle axes, and ſmall but very ſtrong bows adorned with ſerpent ſkin. Their ſtrings are made of ſupple and tender ſtocks of trees, that will not break, and their arrows of hard and light wood. Theſe people, who kill birds flying, ſhoot with ſuch ſurpriſing ſwiftneſs, that they can diſcharge 28 arrows from the bow before the firſt falls to the ground. With equal dexterity they manage their battle-axes; one end of which is ſharpened and cuts like a wedge, and the other flattened like a mallet, with a handle ſet between, about half the length of the iron, rounded at the end like an apple, and covered with the ſkin of a ſerpent. The current money among them is the zimbis or ſhell, which is fixed for, and paſſes among ſeveral African nations. They worſhip the ſun as their chief deity; whom they repreſent by the figure of a man, and the moon by that of a woman. They have alſo an immenſe number of inferior deities, each individual having a particular idol whom he addreſſes on certain occaſions.

ANSIKO, or ANSICO, a kingdom of Africa, bounded on the W. by the river Umbre which runs into the Zaire, the kingdom of Wangua, and the Ambpes who border on Loango; on the N. by ſome deſarts of Nubia: and on the S. by Songo and Sonda, provinces of Congo. Here are great numbers of wild beaſts, as lions, rhinoceroſes, &c. and men ſtill more ſavage. Anſiko has many copper mines. The king of Anſiko, or great Macco, commands 13 kingdoms, and is eſteemed the moſt powerful monarch in Africa. The inhabitants of Angola have a tradition, that this is the proper country of Giagas, who came originally from Sierra Leona, and over ran like a torrent the whole coaſt as far as Benguela; but that, being weakened by numerous battles, and unable to force the defiles in order to return to Sierra Leona, they arrived on the borders of Monomotapa, where being defeated, they were forced to remain in the provinces of Anſiko. See ANSICANS.

ANSIVARII. See ANSIBARII.

ANSLO, or ONSLO, a ſea port town of Norway, in the province of Aggerhuys, 100 miles N. of Gottenburgh, with a biſhop's ſee, under the Abp. of Drontheim. The ſupreme court of juſtice is held here for Norway. It is ſeated on a bay of the ſame name. Lon. 10. 14. E. Lat. 59. 24. N.

ANSON, George, the ſon of William Anſon, Eſq. was born in 1697, at his father's ſeat, in Staffordſhire. Showing an early inclination to the ſea, he received a ſuitable education. The firſt command he enjoyed was that of the Weazle ſloop in 1722; but the moſt memorable action of his life, and the foundation of his future good fortune, took place on his receiving the command of five ſhips, a ſloop, and two victuallers, equipped to annoy the Spaniards in the South Seas, and to co-operate with admiral Vernon, acroſs the iſthmus of Darien: an expedition the principal object of which failed by the unaccountable delay in fitting out the ſquadron. He ſailed, however, in Sept. 1740; doubled Cape Horn in a dangerous ſeaſon; loſt moſt of his

his men by the ſcurvy; and with only one remaining ſhip, the Centurion, croſſed the great Pacific Ocean. If no conſiderable national advantage reſulted from this voyage, Commodore Anſon made his own fortune, and enriched his ſurviving companions, by the capture of a rich galleon on her paſſage from Acapulca to Manilla; with which he returned home round the Cape of Good Hope. He was no leſs fortunate in eſcaping a French fleet then cruiſing in the channel, by ſailing through it during a fog. He arrived at Spithead in June 1744. He was ſoon after appointed rear-admiral of the blue, and a lord of the admiralty. In April 1745, he was made rear-admiral of the white, and the following year vice-admiral of the blue; when he was alſo choſen M. P. for Heydon. In 1747, being on board the Prince George of 90 guns, in company with admiral Warren, and 12 other ſhips, he intercepted, off Cape Finiſterre, a powerful fleet, bound from France to the Eaſt and Weſt Indies; when, he again enriched himſelf and his officers, and at the ſame time ſtrengthened the Britiſh navy, by taking 6 men of war and 4 Eaſt-Indiamen. The French admiral, M. Jonquiere, on preſenting his ſword to the conqueror, ſaid, *Monſieur, vous avez vaincu l'Invincible, et la Gloire vous ſuit:* "Sir, you have conquered the Invincible, and Glory follows you:" alluding to the ſhips, named the *Invincible* and *Glory*, he had taken. For his ſignal ſervices the late majeſty created him Baron Soberton, appointed him vice-admiral of the red, and, on the death of Sir John Norris, made him vice-admiral of England. In 1748 he was made admiral of the blue: afterwards firſt lord of the admiralty, and at length admiral and commander in chief of his majeſty's fleet; in which rank he continued, with a very ſhort interval until his death. The laſt ſervice he performed was to convoy queen Charlotte to England. He died in June 1762. No performance ever met with a more favourable reception, than the account of Anſon's voyage round the world. Though printed in the name of his captain, it was compoſed under his lordſhip's inſpection, and from the materials he himſelf furniſhed, by Mr Benjamin Robins. Lord Anſon was a cool and ſteady man, but too fond of gaming, of which knowing little, he was the conſtant dupe of ſharpers; this made ſome people ſay ſmartly, "though he had been round the world, he never was in it."

(1.) ANSPACH, a marquiſate of Franconia in Germany; bounded on the N. by the biſhoprics of Wartſburg and Bamberg, which laſt likewiſe lies to the W.; by the earldoms of Holach and Oetting, with the biſhopric of Aichſtet, on the S.; and the palatinate of Bavaria and the territory of Nuremberg on the E. The country is fruitful, and interſperſed with woods, which render it agreeable for hunting. The chief towns are Anſpach, Kreglin, Swaſbach, Kreilſheim, Rot, and Waſſer-Truding.

(2.) ANSPACH, a river of Franconia, which runs through the marquiſate. See N° 1.

(3.) ANSPACH, the capital of the marquiſate, is a ſmall but pretty town, very well built, and has ſeveral churches. It is walled round, but has no other fortifications. In the palace there is a remarkable cabinet of curioſities. It is ſeated on the Anſpach, (See N° 2.) 25 miles SW. of Nuremburg, and belongs to the houſe of Brandenburg. Lon. 10. 32. E. Lat. 49. 14. N.

ANSPESSADES, or LANSPESSADES, in the French army, before the revolution, a kind of inferior officers in the foot, below the corporals, but above the common centinels. The word is formed of the Italian *lancia ſpezzata*, q. d. *broken lance*; as they were originally diſbanded *gendarmes*, who, for want of other ſubſiſtence, ſued for a place of ſome diſtinction in the infantry. There were uſually 4 or 5 in each company.

ANSTEL, a ſmall town of Cornwall, between Bodwin and Grampound.

ANSTEY, the name of 4 villages; viz. 1. in Hampſhire, near Alton: 2. in Leiceſterſhire, near Groby: 3. in Suſſex, near Lewes: and, 4. in Warwickſhire, near Coventry.

(1.) ANSTIS, John, an Engliſh antiquary, was born at St Neot's in Cornwall, in 1669. He was educated at Oxford, from whence he removed to the Inner Temple. In 1702, he repreſented the borough of St Germains, in parliament. In 1714 he received the appointment of Garter king at arms, which he held till his death in 1744. He publiſhed, 1. A Letter on the Honour of the Earl Marſhal, 8vo, 1706; 2. The Form of the Inſtallation of the Garter, 8vo, 1720: 3. The Regiſter of the moſt noble order of the Garter, 2 vols fol. 1724: and, 4. Obſervations introductory to an Hiſtorical Eſſay on the Knighthood of the Bath, 4to, 1625.

(2.) ANSTIS, John, ſon of the above, was educated at Corpus Chriſti college, Oxford, and took the degree of LL.D. He was joined with his father in the office of Garter; and in 1725, he obtained the poſt of genealogiſt, and regiſter of the Bath. He died in 1754.

(1.) ANSTRUTHER EASTER, a pariſh of Scotland, in the county of Fife, ſituated between thoſe of Kilrennie and Anſtruther Weſter. It contains above 100 inhabitants. Though epiſcopacy has long been aboliſhed, part of the miniſter's ſtipend ariſes from the *tythes* of the fiſh caught on the coaſt. The climate, trade, &c. are the ſame with thoſe of ANSTRUTHER WESTER. See N° 3 and 4.

(2.) ANSTRUTHER EASTER, a royal burgh of Scotland, ſituated on the SE. coaſt of Fife, in the pariſh above-mentioned, (N° 1.) 26 miles NE. from Edinburgh. A cuſtom-houſe was eſtabliſhed in it, in 1710, and a new key was built in 1753. Ship building is carried on to a conſiderable extent in it. The tonnage, which in 1768 was only 80 tons, is now 1400. It has alſo a thread manufacture.

(3.) ANSTRUTHER WESTER, a pariſh of Scotland, on the SE. coaſt of Fifeſhire, ſeated in a valley, whence the name of both the pariſhes and the boroughs; *ſtruther*, in the Celtic language, ſignifying a valley. It contains about 540 acres of arable land, and 7 or 8 of common. A ſmall river divides it from Anſtruther Eaſter. Though the air is moiſt, the climate is healthy; and, although the ſoil neither agrees with a wet nor a dry ſeaſon, it yields conſiderable crops in favourable weather; ſo that, beſides maintaining the inhabitants,

habitants, quantities of wheat, barley, and beans are exported; though they are obliged to import oats, which do not agree with the ſoil. Agriculture, and the breed of cattle, are much improved. The number of inhabitants, according to Mr Forreſter's Statiſtical report to Sir J. Sinclair, in 1792, was 370; and, what is ſingular, there were 10 males more than females! See § 4.

(4.) ANSTRUTHER WESTER, a royal borough of Scotland, ſituated in the above pariſh, (§ 3.) on the SE. coaſt of Fife, about 25 miles from Edinburgh. Its charters of erection are dated 1554 and 1583. It ſuffered much during the civil wars, in 1645; as well as by an inundation of the ſea, in 1670, which choked up the harbour, waſhed away the bulwarks, and rendered many of the houſes uninhabitable. A ſimilar inundation happened about the end of laſt century, which deſtroyed about a third part of the town. But the Union, however advantageous to Scotland in general, hurt Anſtruther, and moſt of the towns ſituated on the coaſt of Fife, as much, if not more than either wars or inundations, as it almoſt totally annihilated their trade. Before the Union, the two Anſtruthers had 24 ſhips, and 30 fiſhing boats, employed in the fiſhery; whereas in 1764, there were only 3 ſhips of 40 tons burden, and 5 boats belonging to both. It had, however, revived conſiderably before 1792, for there were then 20 ſhips, and 94 men employed by the 2 towns: of which 6 were engaged in the foreign trade, 13 in the coaſting, and one in the fiſhery; and whoſe tonnage amounted to 1172 tons. Of theſe, 8 ſhips, of 532 tons, and 36 men, belonged to Weſter Anſtruther. This burgh is governed by 3 bailies, a treaſurer, and an uncertain number of counſellors, between 6 and 11! Its population in 1792, was 324. The two towns have 3 fairs, on the firſt Tueſday after the 11th of April, 5th July, and 12th November. Lon. 2. 25. W. Lat. 56. 20. N.

ANSTY, two villages; viz. 1. in Devonſhire, near S. Moulton: 2. in Wiltſhire, near Wardour Caſtle.

ANSURII, the collectors of the ANSURIUM.

ANSURIUM. See ANSARIUM.

* ANSWER. *n. ſ.* [from *To anſwer.*] That which is ſaid, whether in ſpeech or writing, in return to a queſtion or poſition.—It was a right *anſwer* of the phyſician to his patient, that had ſore eyes: If you have more pleaſure in wine, than in your ſight, wine is good. *Locke.* 2. An account to be given to the demand of juſtice.—

He'll call you to ſo hot an *anſwer* for it,
That you ſhall chide your treſpaſs. *Shakeſpeare.*

3. In law, a confutation of a charge exhibited againſt a perſon.—A perſonal anſwer ought to have three qualities; it ought to be pertinent to the matter in hand; it ought to be abſolute and unconditional; it ought to be clear and certain. *Ayliffe.*

* *To* ANSWER. *v. n.* [The etymology is uncertain: the Saxons had *anderanian*, but in another ſenſe; the Dutch have *antwoorden.*] 1. To ſpeak in return to a queſtion.—

Are we ſuccour'd? are the Moors remov'd?
Anſwer theſe queſtions firſt, and then a thouſand more,
Anſwer them altogether. *Dryden.*

2. To ſpeak in oppoſition.—No man was able to *anſwer* him a word. *Matt.* xxii. 46.—If it be ſaid, we may diſcover the elementary principles of things, I *anſwer*, that it is not neceſſary that ſuch a diſcovery ſhould be practicable. *Boyle.* 3. To be accountable for: with *for.*—

Theſe many had not dared to do evil
If the firſt man that did th' edict infringe
Had *anſwered for* his deed. *Shakeſpeare.*

4. To vindicate; to give a juſtificatory account of: with *for.*—The night, ſo impudently fixed for my laſt, made little impreſſion of myſelf; but I cannot *anſwer for* my family. *Swift.* 5. To give an account.—How they have been ſince received, and ſo well improved, let thoſe *anſwer* either to God or man, who have been the authors and promoters of ſuch wiſe council. *Temple.* 6. To correſpond to; to ſuit with.—As in water face *anſwereth* to face, ſo the heart of man to man. *Prov.* xxvii. 19. 7. To be equivalent to; to ſtand for ſomething elſe.—A feaſt is made for laughter, and wine maketh merry: but money *anſwereth* all things. *Eccl.* x. 19. 8. To ſatisfy any claim or petition, of right or juſtice.—

Revenge the jeering and diſdain'd contempt
Of this proud king, who ſtudies day and night,
To *anſwer* all the debt he owes unto you.
Shakeſpeare.

—Let his neck *anſwer* for it if there is any martial law in the world. *Shakeſpeare.*—Men no ſooner find their appetites *unanſwered*, than they complain the times are injurious. *Raleigh.*—That yearly rent is ſtill paid, even as the former caſualty itſelf was wont to be, in parcel meal paid in and *anſwered*. *Bacon.* 7. To act reciprocally.—

Say, do'ſt thou yet the Roman harp command?
Do the ſtrings *anſwer* to thy noble hand? *Dryd.*

10. To ſtand as oppoſite or correlative to ſomething elſe.—There can but two things create love, perfection and uſefulneſs; to which *anſwer*, on our part, 1. Admiration; and 2. Deſire: and both theſe are centered in love. *Taylor.* 11. To bear proportion to.—Weapons muſt needs be dangerous things, if they anſwered the bulk of ſo prodigious a perſon. *Swift.* 12. To perform what is endeavoured or intended by the agent.—Our part is, to chooſe out the moſt deſerving objects, and the moſt likely to *anſwer* the ends of our charity; and when this is done, all is done that lies in our power; the reſt muſt be left to Providence. *Atterbury.* 13. To comply with.—

He dies that touches of this fruit,
Till I and my affairs are *anſwered*. *Shakeſpeare.*

14. To ſucceed; to produce the wiſhed event.—Jaſon followed her counſel, whereto, when the event had *anſwered*, he again demanded the fleece. *Raleigh.* 15. To appear to any call, or authoritative ſummons; in which ſenſe, though figuratively, the following paſſage may be, perhaps, taken.—Thou wert better in thy grave, than to *anſwer*, with thy uncovered body, this extremity of the ſkies. *Shak.* 16. To be over-againſt any thing.

Fire *anſwers* fire, and, by their paly beams,
Each battle ſees the other's omber'd face. *Shak.*

* ANSWERABLE. *adj.* [from *anſwer.*] 1. That to which a reply may be made; that which may be anſwered; as, the argument, though ſubtle

ſubtle, is yet *anſwerable*. 2. Obliged to give an account; obliged to anſwer any demand of juſtice; or ſtand the trial of an accuſation.—Every chief of every kindred or family ſhould be *anſwerable*, and bound to bring forth every one of that kindred, at all times to be juſtified, when he ſhould be required, or charged with any treaſon or felony. *Spenſer's State of Ireland.*—Will any man argue, that if a phyſician ſhould manifeſtly preſcribe poiſon to all his patients, he cannot be juſtly punished, but is *anſwerable* only to God? *Swift.* 3. Correſpondent.—It was but ſuch a likeneſs as an imperfect glaſs doth give, *anſwerable* enough in ſome features and colours, but erring in others. *Sidney.*—The daughters of Atlas were ladies, who, accompanying ſuch as came to be regiſtered among the worthies, brought forth children *anſwerable* in quality, to thoſe that begot them. *Raleigh.* 4. Proportionate; ſuitable.—

Only add
Deeds to thy knowledge *anſwerable*; add faith,
Add virtue, patience, temperance; add love
By name to come call'd charity, the ſoul
Of all the reſt. *Milton.*

5. Suitable; ſuited.—The following, by certain eſtates of men, *anſwerable* to that which a great perſon himſelf profeſſeth, as of ſoldiers to him that hath been employed in the wars, hath been a thing well taken even in monarchies. *Bacon.* 6. Equal; equivalent.—There be no kings whoſe means are *anſwerable* unto other men's deſires. *Raleigh.* 7. Relative; correlative.—That, to every petition for things needful, there ſhould be ſome *anſwerable* ſentence of thanks provided particularly to follow, is not requiſite. *Hooker.*

* ANSWERABLENESS. *n. ſ.* [from *anſwerable.*] The quality of being anſwerable. *Diſt.*

* ANSWERABLY. *adv.* [from *anſwerable.*] In due proportion; with proper correſpondence; ſuitably.—The broader ſeas are, if they be entire, and free from iſlands, they are *anſwerably* deeper. *Brerewood on Languages.*

* ANSWERER. *n. ſ.* [from *anſwer.*] 1. He that anſwers; he that ſpeaks in return to what another has ſpoken.—I know your mind, and I will ſatisfy it, neither will I do it like a niggardly *anſwerer* going no further than the bounds of the queſtion. *Sidney.* 2. He that manages the controverſy againſt one that has written firſt.—It is very unfair in any writer to employ ignorance and malice together; becauſe it gives his *anſwerer* double work. *Swift.*

* ANSWER-JOBBER. *n. ſ* [from *anſwer* and *jobber.*] He that makes a trade of writing anſwers.—What diſguſts me from having any thing to do with *anſwer-jobbers*, is, that they have no conſcience. *Swift.*

* ANT. *n. ſ.* [*æmett*, Sax. which *Junius* imagines, not without probability, to have been firſt contracted to *æmt*, and then ſoftened to *ant.*] An emmet; a piſmire. A ſmall inſect that lives in great numbers together in hillocks.—We'll ſet thee to ſchool to an *ant*, to teach thee there's no lab'ring in the winter. *Shak.*—

Learn each ſmall peoples's genius, policies;
The *ant's* republick, and the realm of bees. *Pope.*

(1.) ANT, in zoology. See FORMICA and TERMES.

* AN'T, a contraction for *and it*, or rather *and if it*; as, *an't pleaſe you*; that is, *and if it pleaſe you.*

(1.) * ANT-BEAR. *n. ſ.* [from *ant* and *bear.*] An animal that feeds on ants.

(2.) ANT-BEAR, or ANT-EATER, in zoology. See MYRMECOPHAGA.

(1.) * ANT HILL, or HILLOCK. *n. ſ.* [from *ant* and *hill.*] The ſmall protuberances of earth in which ants make their neſts.—Put blue flowers into an *ant-hill*, they will be ſtained with red; becauſe the ants drop upon them their ſtinging liquor, which hath the effect of oil of vitriol. *Ray.*—Thoſe who have ſeen *ant hillocks*, have eaſily perceived thoſe ſmall heaps of corn about their neſts. *Addiſon.*

(2.) ANT-HILLS, METHODS OF DESTROYING. Ant hills do a great deal of miſchief to dry paſtures, not only by waſting ſo much land as they cover, but by hindering the ſcythe in mowing the graſs, and yielding a poor hungry food pernicious to cattle. The manner of deſtroying them is to cut them into four parts from the top, and then dig into them ſo deep as to take out the core below, ſo that when the turf is laid down again, it may lie ſomewhat lower than the level of the reſt of the land: by this means it will be wetter than the reſt of the land; and this will prevent the ants from returning to the ſame place, which otherwiſe they would certainly do. The earth that is taken out muſt be ſcattered to as great a diſtance every way as may be, otherwiſe they will collect it together and make another hill juſt by. The proper time for doing this is winter; and if the places be left open, the froſt and rains of that time of the year will deſtroy the reſt: but in this caſe care muſt be taken that they are covered up early enough in the ſpring, otherwiſe they will be leſs fertile in graſs than the other places. In Hertfordſhire they uſe a particular kind of ſpade for this purpoſe. It is very ſharp, and formed at the top into the ſhape of a creſcent, ſo that the whole edge makes up more than three-fourths of a circle; this cuts in every part, and does the buſineſs very quickly and effectually. Others uſe the ſame inſtruments that they do for mole-hills. Human dung is a better remedy than all theſe, as is proved by experiment; for it will kill great numbers of them, and drive all the reſt away, if only a ſmall quantity of it be put into their hills. Unſlacked lime has alſo been uſed ſucceſsfully.

ANT-LION. See FORMICA LEO.

ANT, MUSK, the name given, by Liſter and Ray, to a peculiar ſpecies of ant, which is of the number of the perfumed inſects. It is found on dry banks, and is ſo much ſmaller than the common ant, that it needs no other diſtinction. Thoſe of this ſpecies which are without wings are of a yelloviſh colour, and when bruiſed or cruſhed emit a ſharp and acid ſmell, as the common ant does; but thoſe which have wings are coal-black, and theſe inſtead of the four ſmell of the others, emit a perfume not to be endured for its ſtrength. The ſmell of all the perfumed inſects goes off in keeping; and theſe little creatures, after they have been dead and dry ſome time, are found to ſmell leſs ſtrongly, but much more agreeably. Phil. Tranſ. No. 77.

ANTS,

ANTS, ACID OF, an acid produced by diſtilling millions of theſe inſects, either without addition, or with water. It reſembles vinegar in many reſpects; but differs from it in forming cryſtals with magneſia, iron, and zinc. Its attractions are not yet determined, but ſeem to coincide with thoſe of vinegar.

ANTS EGGS, a kind of little white balls found in the neſts of ants, ordinarily ſuppoſed to be the ova of this inſect. Late naturaliſts have obſerved, that theſe are not properly the ants eggs, but the young brood themſelves in their firſt ſtate; they are ſo many little vermiculi wrapped up in a film or ſkin, compoſed of a ſort of ſilk, which they ſpin out of themſelves as ſilk-worms and caterpillars do. At firſt they are hardly obſerved to ſtir: but, after a few days continuance, they exhibit a feeble motion of flexion and extenſion; and begin to look yelloviſh and hairy, ſhaped like ſmall maggots, in which ſhape they grow up till they are almoſt as large as ants. When they paſs their metamorphoſis, and appear in their proper ſhape, they have a ſmall black ſpeck on them cloſe to the anus of the included ant, which M. Lewenhoek probably enough imagines to be the feces voided by it. Sir Ed. King, M. D. opened ſeveral of theſe vulgarly reputed eggs; in ſome of which he found only a maggot in the circumſtances as above deſcribed; while in another the maggot had begun to put on the ſhape of an ant about the head, having two little yellow ſpecks, where the eyes were to be. In others, a further progreſs was obſerved, the included maggots being furniſhed with every thing to complete the ſhape of an ant, but wholly tranſparent, the eyes only excepted, which were as black as bugles.—Laſtly, in others, he took out ants every way perfect and complete, which immediately crept about among the reſt. Theſe ſuppoſed ants eggs are brought up every morning in ſummer, near the top of the neſt, where they are lodged all the warm part of the day, within reach of the ſun's influence. At night, or if it be cool, or like to rain, they carry them down to a greater depth; ſo that you may dig a foot depth e'er you come at them. The true ants eggs are the white ſubſtance, which upon opening their banks, appears to the eye like the ſcatterings of fine white ſugar, or ſalt, but very ſoft and tender. Examined by a microſcope, it is found to conſiſt of ſeveral pure, white appearances, in diſtinct membranes, all figured like the leſſer ſorts of birds eggs, and as clear as the bladder of a fiſh. The ſame ſubſtance is found in the bodies of the ants themſelves. On this ſpawn, when emitted, they lie in multitudes, to brood, till it is turned into little vermicles as ſmall as mites, commonly called *ants eggs*.

ANTS, VISITING. At Paramaribo, a Dutch colony in the province of Surinam, there are a ſpecies of ants, which the Portugueſe call *viſiting ants*; they march in troops; and as ſoon as they appear, all the coffers and cheſts of drawers are laid open, which they clear of rats, mice, and a peculiar ſort of inſect in that country called *cackerlacks*, and of other noxious animals. If any one chance to moleſt them, they fall upon him, and tear in pieces his ſtockings and ſhoes. Their viſits are rare: and ſometimes they do not appear for 3 years. *Templeman's Obſ. vol. i p.* 36.

(1.) ANTA, in the ancient architecture, a ſquare pilaſter, placed at the corners of buildings.

(2.) ANTA, or ANTE, a ſmall kingdom on the Gold Coaſt of Africa, extending about ten leagues in length. The country is covered with large trees, among which ſtands a number of fine villages.—The ſoil is exceedingly rich, and the face of the country beautiful. The air is alſo much more ſalubrious than in other places of the Gold Coaſt; it being obſerved by all writers, that the number of deaths here bears no proportion to that on any other parts of the Coaſt of Guinea. This country contains the following villages, which deſerve a particular deſcription on account of the commerce they drive; viz. *Bourtrey*, *Tokorari*, *Sabada*, and *Sama*; for which, ſee thoſe articles.—Formerly Anta was potent and populous, inhabited by a bold and rapacious people, who greatly annoyed the Europeans by their frequent incurſions; but by continual wars with their neighbours they are now greatly enfeebled, and the country in a manner depopulated. The ſpirit of the few remaining inhabitants is fled: they are diſpirited, and abject, ſeeking protection from the Dutch and other Europeans who have forts on this coaſt, and looking upon them as their beſt friends.

ANTACÆUS, in ichthyology, a name firſt given by Ælian and Strabo to the *ichthyocolla piſcis*, the iſinglaſs fiſh, or *buſo*; and afterwards by Johnſton and others, not only to this fiſh, but to the common ſturgeon.

ANTACHATES is uſed by ſome naturaliſts, for a kind of bituminous ſtone, of the nature of amber, though of a different colour, which in burning yields a ſmell like myrrh.

ANTACID. See ANTI-ACID.

ANTÆ. See ANTICUM.

ANTÆCI. See ANTOECI.

(1.) ANTÆUS, in fabulous hiſtory, a giant of Libya, the ſon of Neptune and Terra. Deſigning to build a temple to his father, of men's ſkulls, he ſlew all he met, but Hercules fighting him, and perceiving the aſſiſtance he received from his mother (for by a touch of the earth he refreſhed himſelf when weary,) lifted him up from the ground, and ſqueezed him to death.

(2.) ANTÆUS, CONJECTURES CONCERNING. Antæus was king of Mauritania; and if we may venture to expiſcate true hiſtory out of fable, from ſeveral circumſtances, it would appear probable that he was the ſame with Atlas. They are both ſaid to have been ſons of Neptune, who reigned over Mauritania, Numidia, and a great part of Libya; as may be inferred from his having ſuch particular marks of diſtinction conferred upon him by the inhabitants of thoſe regions. They both ruled with abſolute power over a great part of Africa, particularly Tingitania. Hercules defeated and ſlew Antæus in the ſame war wherein he took Libya from Atlas: both Atlas and Antæus invaded Egypt, and contended with Hercules in the wars with the gods, and were both vanquiſhed by him. Antæus, as well as Atlas, was famed for his knowledge in aſtronomy; from all which we may conclude

conclude them to have been one and the ſame Mauritanian monarch. Antæus in his wars with Hercules, who commanded an army of Egyptians and Ethiopians, behaved with great bravery. Receiving large reinforcements of Libyan troops, he cut off vaſt numbers of Hercules's men: but that celebrated commander having at laſt intercepted a ſtrong body of Mauritanian or Libyan forces ſent to the relief of Antæus, gave him a total overthrow, wherein he and the beſt part of his forces were put to the ſword. This deciſive action put Hercules in poſſeſſion of Libya and Mauritania, and conſequently of all the riches in thoſe kingdoms: hence aroſe the fable above-mentioned. (See N° 1.) Hence likewiſe may be deduced the table, that Hercules took Atlas's globe upon his own ſhoulders, overcame the dragon that guarded the orchards of the Heſperides, and made himſelf maſter of all the golden fruit. The golden apples, ſo frequently mentioned by the old mythologiſts, were the treaſures that fell into Hercules's hands upon Antæus's defeat, the Greeks giving the oriental word תפוח, *riches*, the ſignification affixed to their own term, μηλα, *apples*. After the moſt diligent and impartial examination of all the different hypotheſes of hiſtorians and chronologers, relating to Atlas and Antæus, we find none ſo little clogged with difficulties as that of Sir Iſaac Newton. According to that illuſtrious author, Ammon, the father of Seſac, was the firſt king of Libya, or that vaſt tract extending from the borders of Egypt to the Atlantic ocean; the conqueſt of which country was effected by Seſac in his father's life-time. Neptune afterwards excited the Libyans to a rebellion againſt Seſac, whom they ſlew; and then invaded Egypt under the command of Atlas or Antæus, the ſon of Neptune, Seſac's brother and admiral. Not long after, Hercules, the general of Thebais and Ethiopia for the gods or great men of Egypt, reduced a ſecond time the whole continent of Libya, having overthrown and ſlain Antæus near a town in Thebais, from that event called Antæa or Antæopolis: this, we ſay, is the notion advanced by Sir Iſaac Newton, who endeavours to prove, that the firſt reduction of Libya by Seſac, happened a little more than 1000 years before the birth of Chriſt, as the laſt by Hercules did ſome few years after.

ANTAGOGE. See ANTANAGOGE.

(1.) * ANTAGONIST. *n. ſ.* [ανθ and αγωνιζω.] 1. One who contends with another; an opponent. It implies generally a perſonal and particular oppoſition.—Our *antagoniſts* in theſe controverſies may have met with ſome not unlike to Ithacius. *Hooker.*—

What was ſet before him,
To heave, pull, draw, and break, he ſtill perform'd,
None daring to appear *antagoniſt*. *Milton.*

—It is not fit, that the hiſtory of a perſon ſhould appear, till the prejudice both of his *antagoniſts* and adherents be ſoftened and ſubdued. *Addiſon.* 2. Contrary.—The ſhort club conſiſts of thoſe who are under five feet; ours is to be compoſed of ſuch as are above ſix. Theſe we look upon as the two extremes and *antagoniſts* of the ſpecies; conſidering all theſe as neuters, who fill up the middle ſpace. *Addiſon.* 3. In anatomy, the *antagoniſt* is that muſcle which counteracts ſome others.—A relaxation of a muſcle muſt produce a ſpaſm in its *antagoniſt*, becauſe the equilibrium is deſtroyed. *Arbuthnot.*

(2.) ANTAGONIST MUSCLES, in anatomy, thoſe which have oppoſite functions; as flexors and extenſors, abductors and adductors, &c.

* *To* ANTAGONIZE. *v. n.* [ανθ and αγωνιζω.] To contend againſt another. *Dict.*

* ANTALGICK. *adj.* [from ανθ, againſt, and αλγος, pain.] That which ſoftens pain; anodyne.

ANTALIUM, in natural hiſtory, a ſmall ſea-ſhell of a tubular form, whence it is alſo denominated *tubulus marinus*.—The antalium, *antale*, or *antalus*, is about an inch and a half long; the thickneſs of a large quill at one end, and of a ſmall one at the other; fluted from end to end, of a white or greeniſh white colour, is found on rocks, and at the bottom of the ſea. It is alkaline, and ſaid to be of ſome medicinal uſe as a reſolvent and dryer; at leaſt by the ancients. The antalium bears a near affinity both in origin, ſtructure, and uſe, with the *dentalium*.

* ANTANACLASIS. *n. ſ.* [Lat. from αντανακλασις, from αντιανακλαω, to drive back.] 1. A figure in rhetorick, when the ſame word is repeated in a different, if not in a contrary ſignification; as, *In thy youth learn ſome* craft, *that in old age thou mayſt get thy living without* craft. *Craft*, in the firſt place, ſignifies ſcience or occupation; in the ſecond, deceit or ſubtilty. 2. It is alſo a returning to the matter at the end of a long parentheſis; as, Shall that heart *(which does not only feel them, but hath all motion of his life placed in them)*, ſhall that heart, *I ſay*, &c. *Smith's Rhetorick.*

ANTANAGOGE, [from ανθ, and αναγωγη, contumacious,] a figure in rhetoric; when not being able to anſwer the accuſation of the adverſary, we return the charge, by loading him with the ſame or other crimes; which is uſually called recrimination.

(1.) ANTANDROS, an Æolian general, who founded the town of ANTANDROS. See N° 2.

(2.) ANTANDROS, in ancient geography, a town of Myſia, on the ſea-coaſt, at the foot of mount Alexandrea. It was a town of the Leleges, anciently called *Edonis*, then *Cimmeris*, and now *S. Dimitri*.

ANTANISOPHYLLUM, in botany, hog-weed.

ANTAPHRODISIACS, in pharmacy, medicines proper to diminiſh the ſemen, and conſequently to leſſen the incitement to venery.

* ANTAPHRODITICK. *adj.* [from ανθ, againſt, and αφροδιτη, Venus.] That which is efficacious againſt the venereal diſeaſe.

ANTAPOCHA, in the civil law, denotes one's acknowledgement in writing of money paid, in the way of rent, penſion, intereſt, or the like incumbrance. Such inſtrument, or antapocha, the debtor gives upon making payment to the creditor, to ſerve as a proof of the charge or incumbrance for futurity, and exclude any claim of preſcription againſt the payment of it. The antapocha differs from the *apocha*, in that this latter is given by the creditor to the debtor.

ANTAPODOSIS, in rhetoric, the counter-

part, or latter clauſe of a ſimilitude, anſwering to the former.

* ANTAPOPLECTICK. *adj.* [ἀντὶ, againſt, and ἀποπλῆξις, an apoplexy.] Good againſt an apoplexy.

(1.) * ANTARCTICK. *adj.* [ἀντὶ, againſt, and ἄρκτος, the bear, or northern conſtellation.] The ſouthern pole, ſo called, as oppoſite to the northern.—

Downward as far as *antarctick* *Milton.*
They that had ſail'd from near the *antarctick* pole,
Their treaſure ſafe, and all their veſſels whole,
In ſight of their dear country ruin'd be,
Without the guilt of either rock or ſea. *Waller.*

(2.) ANTARCTIC CIRCLE is one of the leſſer circles of the ſphere, parallel to the equator, at the diſtance of 23° 30′ from the ſouth pole. It takes its name from its being oppoſite to another circle, parallel likewiſe to the equator, and at the ſame diſtance from the north pole, called the ARCTIC CIRCLE.

(3.) ANTARCTIC POLE, See N° 1. The ſtars near the antarctic pole never appear above our horizon.

ANTARES, in aſtronomy, the name of a ſtar of the firſt magnitude, called alſo the ſcorpion's heart. Its longitude is 60° 13′ 14″ of Sagittarius; and its latitude 4° 31′ 26″ S.

* ANTARTHRITICK. *adj.* [ἀντὶ, againſt, and ἀρθρῖτις, the gout.] Good againſt the gout.

* ANTASTHMATICK. *adj.* [from ἀντὶ, and ἀσθμα.] Good againſt the aſthma.

ANTASTROPHE, [from ἀντὶ, and στρέφω, I turn,] in rhetoric, a ſpecies of antepoſition.

ANTAVARE, a province of the Iſland of Madagaſcar, lying about 21. 30. S. Lat. and bounded by the province and cape of Manouſi. The greateſt part of it is watered by the river Mananzari, whoſe ſource is in the red mountains of Ambohitſmene.

(1.) * ANTE, a Latin particle ſignifying *before*, which is frequently uſed in compoſitions; as, *antediluvian*, before the flood; *antechamber*, a chamber leading into another apartment.

(2.) ANTE, a diſtrict of Guinea.

(3.) ANTE, a river of France, in the ci-devant province of Normandy, which riſes beyond Falaiſe, and after a courſe of 4 miles falls into the Vire.

(4.) ANTE, in heraldry, denotes that the pieces are let into one another in ſuch form as there is expreſſed; for inſtance, by dove-tails, rounds, ſwallow-tails, or the like.

* ANTEACT. *n. ſ.* [from *ante* and *act.*] A former act.

* ANTFAMBULATION. *n. ſ.* [from *ante* and *ambulatio*, Lat.] A walking before.

ANTEAMBULONES, [from *ante*, before, and *ambulo*, to walk,] in Roman antiquity, ſervants who went before perſons of diſtinction to clear the way for them. They uſed this formula, *Date locum domini meo*, i. e. Make way for my maſter!

ANTECANIS, in aſtronomy, the conſtellation otherwiſe called *canis minor*, or the ſtar *procyon*. It is thus denominated as preceding, or being the forerunner of the *canis major*, and riſing a little before it.

ANTECEDANEOUS, *adj.* foregoing. *Bailey.*

* *To* ANTECEDE. *v. n.* [from *ante*, before, and *cedo*, to go.] To precede; to go before.—It ſeems conſonant to reaſon, that the fabrick of the world did not long *antecede* its motion. *Hale.*

(1.) * ANTECEDENCE. *n. ſ.* [from *antecedo*.] The act or ſtate of going before; precedence.—It is impoſſible that mixed bodies can be eternal, becauſe there is neceſſarily a pre-exiſtence of the ſimple bodies, and an *antecedence* of their conſtitution preceding the exiſtence of mixed bodies. *Hale.*

(2.) ANTECEDENCE, in aſtronomy, an apparent motion of a planet towards the weſt, or contrary to the order of the ſigns.

(1.) * ANTECEDENT. *adj.* [*antecedens*, Lat.] 1. Going before; preceding. *Antecedent* is uſed, I think, only with regard to time; *precedent*, with regard both to time and place.—To aſſert, that God looked upon Adam's fall as a ſin, and puniſhed it, when, without any *antecedent* ſin of his, it was impoſſible for him not to fall, ſeems a thing that highly reproaches eſſential equity and goodneſs. *South.* 2. It has *to* before the thing which is ſuppoſed to follow.—No one is ſo hardy as to ſay, God is in his debt; that he owed him a nobler being: for exiſtence muſt be *antecedent to* merit. *Collier.*—Did the blood firſt exiſt, *antecedent to* the formation of the heart? But that is to ſet the effect before the cauſe. *Bentley.*

(2.) * ANTECEDENT. *n. ſ.* [*antecedens*, Lat.] 1. That which goes before.—A duty of ſo weighty an influence, that it is indeed the neceſſary *antecedent*, if not alſo the direct cauſe of a ſinner's return to God. *South.* 2. In grammar, the noun to which the relative is ſubjoined; as, the *man* who comes hither.—Let him learn the right joining of ſubſtantives with adjectives, the noun with the verb, and the relative with the *antecedent*. *Aſcham.* 3. In logick, the firſt propoſition of an enthymene or argument, conſiſting only of two propoſitions.—Conditional or hypothetical propoſitions are thoſe whoſe parts are united by the conditional particle *if*; as, *if* the ſun be fixed, the earth muſt move: *if* there be no fire, there will be no ſmoke. The firſt part of theſe propoſitions, or that wherein the condition is contained, is called the *antecedent*, the other is called the *conſequent*. *Watt's Logick.*

(3.) ANTECEDENT, in mathematics, is the firſt of two terms of a ratio, or that which is compared with the other.

(4.) ANTECEDENT SIGNS, in medicine, are ſuch ſymptoms of diſorder as appear before a diſtemper is ſo formed as to be reducible to any particular claſs, or proper denomination.

(5.) ANTECEDENTS, in rhetoric, are ſuch propoſitions as being once allowed, others neceſſarily or very probably follow. This is one of the 16 topics, enumerated by Cicero and Quintilian.

* ANTECEDENTLY. *adv.* [from *antecedent*.] In the ſtate of antecedence, or going before; previouſly.—We conſider him *antecedently* to his creation, while he yet lay in the barren womb of nothing, and only in the number of poſſibilities. *South.*

(1.) * ANTECESSOR. *n. ſ.* [Latin.] One who goes before, or leads another; the principal. *Dict.*

(2.) ANTECESSOR, was an appellation given to thoſe who excelled in any ſcience. Juſtinian applied it particularly to profeſſors of civil law; and,

in the univerſities of France, the teachers of law, before the revolution, took the title *anteceſſores* in all their theſes. But, as the *Organical Articles of the Convention*, 26 *Meſſidor*, (July 15, 1801,) *in the year* 9, forbid even archbiſhops and biſhops any other title, than that of *Citizen* or *Monſieur*, the teachers of *law* will ſcarce now be allowed ſuch honours.

(1.) * ANTECHAMBER. *n. ſ.* [from *ante*, before, and *chamber*; it is generally written, improperly, *antichamber*.] The chamber that leads to the chief apartment.—

The empreſs has the *antichambers* paſt,
And this way moves with a diſorder'd haſte.
Dryden.

—His *antichamber*, and room of audience, are little ſquare chambers wainſcoted. *Addiſon.*

(2.) ANTECHAMBER. In addition to Dr Johnſon's explanation of this word, we may add, that it alſo, and perhaps chiefly, ſignifies, an outer room, where ſtrangers wait, till the maſter of the houſe, or perſon they call for, is acquainted.

(1.) * ANTECURSOR. *n. ſ.* [Lat.] One who runs before. *Dict.*

(2.) ANTECURSORES, in the Roman armies, a party of horſe detached before, partly to get intelligence, proviſions, &c. and partly to chooſe a proper place to encamp in. Theſe were alſo called *anteceſſores*, and by the Greeks *prodromi*.

ANTEDATE, among lawyers, a ſpurious or falſe date prior to the true date of a bond, bill, or the like.

* *To* ANTEDATE. *v. a.* [from *ante*, and *do*, *datum*, Lat.] 1. To date earlier than the real time, ſo as to confer a fictitious antiquity.—By reading, a man does, as it were *antedate* his life, and makes himſelf cotemporary with the ages paſt. *Collier.* 2. To take ſomething before the proper time.—

Our joys below it can improve,
And *antedate* the bliſs above. *Pope.*

(1.) * ANTEDILUVIAN. *adj.* [from *ante*, before, and *diluvium*, a deluge.] 1. Exiſting before the deluge.—During the time of the deluge, all the ſtone and marble of the *antediluvian* earth were totally diſſolved. *Woodward.* 2. Relating to things exiſting before the deluge.—The next intends only the line of Seth conduceable unto the genealogy of our Saviour, and the *antediluvian* chronology. *Brown's Vulgar Errours.*

(2.) * ANTEDILUVIAN. *n. ſ.* One that lived before the flood.—We are ſo far from repining at God, that he hath not extended the period of our lives to the longevity of the *antediluvians*, that we give him thanks for contracting the days of our trial. *Bentley.*

(3.) ANTEDILUVIANS, a general name for all mankind who lived before the flood, including the whole human race from the creation to the deluge.

(4.) ANTEDILUVIANS, CHRONOLOGY OF THE. As Moſes has not ſet down the particular time of any tranſaction before the flood, except only the years of the fathers' ages, wherein the ſeveral deſcendants of Adam in the line of Seth were begotten, and the length of their ſeveral lives, chronologers have endeavoured to fix the years of the lives and deaths of thoſe patriarchs, and the diſtance of time from the creation to the deluge. In this there could be little difficulty were there no varieties in the ſeveral copies we now have of Moſes's writings, viz. the Hebrew, the Samaritan, and the Greek verſions of the Septuagint; but as theſe differ very conſiderably from one another, learned men are much divided in their opinions concerning the chronology of the firſt ages of the world; ſome preferring one copy, and ſome another. That the reader may the better judge of theſe variations, they are exhibited in the following table, with the addition of thoſe of Joſephus as corrected by Dr Wells and Mr Whiſton; to which we ſubjoin other three tables to explain the conſequence of theſe variations by ſhowing in what year of his cotemporaries, the birth and death of each patriarch happened, according to the computations of theſe different verſions.

I. *A* TABLE *of the* YEARS *of the* ANTEDILUVIAN PATRIARCHS.

	Ages of the Patriarchs at the births of their ſons.				Years they lived after their ſons births.			Length of their lives.		
	Heb.	Sam.	Sept.	Joſ.	Heb.	Sam.	Sept.	Heb.	Sam.	Sept.
Adam,	130	130	230	130	800	800	700	930	930	930
Seth,	105	105	205	105	807	807	707	912	912	912
Enos,	90	90	190	90	815	815	715	905	905	905
Cainan,	70	70	170	70	840	840	740	910	910	910
Mahalaleel,	65	65	165	65	830	830	730	895	895	895
Jared,	162	62	162	62	800	785	800	962	847	962
Enoch,	65	65	165	65	300	300	200	365	365	365
Methuſelah,	187	67	166	187	762	653	802	969	720	969
Lamech,	182	53	188	182	595	600	565	777	653	753
Noah was aged at the Flood.	600	600	600	600						
To the Flood,	1656	1307	2242	1556						

II. *A* CHRONOLOGICAL TABLE *of the* YEARS *of the* PATRIARCHS *according to the* COMPUTATION *of the* HEBREW.

	Years of the world.	Years of Seth.	Years of Enos.	Years of Cainan.	Years of Mahalaleel.	Years of Jared.	Years of Enoch.	Years of Methuſelah.	Years of Lamech.	Years of Noah.
Adam created,	1									
Seth born, -	130									
Enos born, -	235	105								
Cainan born, -	325	195	90							
Mahalaleel born, -	395	565	160	70						
Jared born, -	460	330	225	135	65					
Enoch born, -	622	492	387	297	227	162				
Methuſelah born,	687	557	452	362	292	227	65			
Lamech born, -	874	774	639	549	479	414	252	187		
Adam dies, -	930	800	695	605	535	470	308	243	56	
Enoch tranſlated,	987	857	752	662	592	527	365	300	113	
Seth dies, -	1042	912	807	717	647	582		355	168	
Noah born, -	1056		821	731	661	596		369	182	
Enos dies, -	1140		905	815	745	680		453	266	84
Cainan dies, -	1235			910	840	775		548	361	179
Mahalaleel dies,	1290				895	830		603	416	234
Jared dies, -	1422					962		735	548	366
Japhet born, -	1556							869	682	500
Shem born, -	1558							871	684	502
Lamech dies, -	1651							964	777	595
Methuſelah dies,	1656				The Flood,			969		600

III. CHRONOLOGICAL TABLE *of the* YEARS *of the* PATRIARCHS *according to the* COMPUTATION *of the* SEPTUAGINT.

	Years of the world.	Years of Seth.	Years of Enos.	Years of Cainan.	Years of Mahalaleel.	Years of Jared.	Years of Enoch.	Years of Methuſelah.	Years of Lamech.	Years of Noah.
Adam created, -	1									
Seth born, -	230									
Enos born, -	435	205								
Cainan born, -	625	395	190							
Mahalaleel born,	795	565	360	170						
Adam dies, -	930	700	495	305	135					
Jared born, -	960	730	525	335	165					
Enoch born, -	1122	892	687	497	325	162				
Seth dies, -	1142	912	707	517	347	182				
Methuſelah born,	1387		852	662	492	327	165			
Enos dies, -	1340		905	715	545	380	218			
Lamech born, -	1474			849	679	514	352	187		
Enoch tranſlated,	1487			862	692	527	365	200		
Cainan dies, -	1535			910	740	575		248	61	
Noah born, -	1662				867	702		375	188	
Mahalaleel dies,	1690				895	730		403	216	28
Jared dies, -	1922					962		635	448	260
Japhet born, -	2162							875	688	500
Shem born, -	2164							877	690	502
Lamech dies, -	2227							940	753	565
Methuſelah dies,	2256							969		594
The Flood, -	2262									600

IV. CHRO-

IV. CHRONOLOGICAL TABLE *of the* YEARS *of the* PATRIARCHS, *according to the* COMPUTATION *of the* SAMARITAN PENTATEUCH.

	Years of the world.	Years of Seth.	Years of Enos.	Years of Cainan.	Years of Mahalaleel.	Years of Jared.	Years of Enoch.	Years of Methuſelah.	Years of Lamech.	Years of Noah.
Adam created,	1									
Seth born, -	130									
Enos born, -	235	105								
Cainan born,	325	195	90							
Mahalaleel born,	395	265	160	70						
Jared born, -	460	330	225	135	65					
Enoch born, -	522	392	287	197	127	62				
Methuſelah born,	587	457	352	262	192	127	65			
Lamech born, -	654	524	419	329	259	194	132	67		
Noah born, -	707	577	472	382	312	247	185	120	53	
Enoch tranſlated,	887	757	652	562	492	427	365	300	233	180
Adam dies, -	930	800	695	605	535	470		343	276	223
Seth dies, -	1042	912	807	717	647	582		462	388	335
Enos dies, -	1140		905	815	745	680		553	486	433
Japhet born, -	1207			882	812	747		620	553	500
Shem born, -	1209			884	814	749		622	555	502
Cainan dies, -	1235			910	840	775		648	581	528
Mahalaleel dies,	1290				895	830		703	636	583
Jared, Methuſela, & Lamech, die,	1307		The Flood,			847		720	653	600

(5.) ANTEDILUVIANS, CHRONOLOGY OF THE, COMPARED AND CORRECTED. The manuſcript from which the Samaritan Pentateuch was publiſhed, agrees exactly with the Samaritan numbers given by Euſebius. But St Jerom tells us, that, in his time there were ſome Samaritan copies which make Methuſelah 187 years old at the birth of Lamech, and Lamech 182 at the birth of Noah, as the Hebrew does. Now if theſe numbers be approved as the true original numbers, the interval from the creation to the flood will be 1556 years; differing from the Hebrew computation only 100 years in the age of Jared at the birth of Enoch: and if this laſt be allowed to be a miſtake of the tranſcriber by his dropping a number, and his writing 62 inſtead of 162, as has been ſuſpected, the Samaritan will be perfectly reconciled with the Hebrew, and all difference between them vaniſh. As to the Septuagint, in the common editions of that verſion, the age of Methuſelah at the birth of Lamech is 167; and conſequently the ſum of this period, according to them, is no more than 2242. But in this caſe Methuſelah will outlive the flood 14 years; and we may well wonder, with Euſebius, where he was preſerved. To obviate this objection, we are told, that, in ſome copies, Methuſelah is ſaid to have lived but 782 (not 802) years after the birth of Lamech, and no more than 949 in all. But the Alexandrian manuſcript entirely takes away the difficulty, by giving the ſame number in this place with the Hebrew. Pezron is of opinion, that the age of Lamech at the birth of Noah ſhould be but 182, as it is both in the Hebrew and in Joſephus, ſuppoſing, with St Auſtin, that the preſent number is the error of the ſcribe who firſt copied the original Septuagint manuſcript in Ptolemy's library. So that he computes 2256 years to the flood. And, if this correction be admitted, and one more mentioned alſo by St Auſtin, viz. that Lamech lived 595 years after the birth of Noah, and not 565, as in the preſent copies, there will then remain no other difference between the Septuagint and the Hebrew than 600 years added to the ages of the ſix patriarchs when they begat their ſons, and Methuſaleh will, conformably to the Hebrew and Samaritan, have died in the year of the flood.

(6.) ANTEDILUVIANS, HISTORY OF THE. From Moſes's account of our great progenitor, that "the Lord God took the man and put him into the garden," it appears probable that Adam was not created within the precincts of Paradiſe; and it is afterwards ſaid, upon his being turned out of the garden, "He was ſent to till the ground whence he was taken."—As to the ſituation of this garden, concerning which there has been much learned inquiry, ſee PARADISE. Adam was doubtleſs created in the prime of his life, with all his powers and faculties in the higheſt degree of ſtrength and vigour. His body would be graceful, and well proportioned; while his countenance was comely, and glowed with all the luſtre of youthful innocence. Many have entertained an opinion (as mentioned under the article ADAM), that our firſt parent was created an adept in knowledge

ledge and in ſcience, a conſummate philoſopher, and an accompliſhed divine. But the very reverſe of this muſt be true, providing we give credit to the account which Moſes gives of him. If Adam was created with intuitive knowledge, for what end was he endowed with the ſenſes of a man, through which ideas might be conveyed to his mind, and make him capable of ſuch improvements as ariſe from experience and obſervation? And if he originally poſſeſſed ſuch a fund of valuable knowledge, why had he ſuch an ardent thirſt for an unwarrantable portion of more, and for the ſake of this additional pittance forfeited his happineſs and life? Beſides, if Adam was at firſt all light and knowledge, and was ſoon after reduced to a ſtate of ignorance and error, this tranſition would make a retrogradation in the ſyſtem of nature, quite diſſimilar to that uniformity which obtains throughout the whole of the divine œconomy. Moſes introduces our firſt parents into life in the moſt natural manner, as having capacities to acquire knowledge, ſenſes to receive impreſſions from objects around them, and a ſufficient degree of reaſon to form a judgment of the things perceived: yet all theſe faculties can only be conſidered as ſo many inſtruments, by the exerciſe of which they might be enabled to diſcharge the duties of their future life. The following portrait of our firſt progenitor when he firſt came into life, drawn by Buffon, is extremely beautiful, while, at the ſame time, it is quite conſiſtent with the Moſaic hiſtory. Let us ſuppoſe a man in the ſame ſituation with him who firſt received exiſtence; a man whoſe organs were perfectly formed, but who was equally new to himſelf, and to every object which ſurrounded him. Were he to give a hiſtory of his thoughts, and of the manner in which he received impreſſions, he might give ſome ſuch information as this. "I remember the moment when my exiſtence commenced. It was a moment replete with joy, with amazement and anxiety. I never knew what I was, where I was, nor whence I came. I opened my eyes. But what an amazing increaſe of ſenſation! The light, the celeſtial vault, the verdure of the earth, the tranſparency of the waters, gave animation to my ſpirits, and conveyed pleaſures which exceed the powers of expreſſion. At firſt I believed that all theſe objects exiſted within me, and formed a part of myſelf. When, turning mine eyes to the ſun, his ſplendour overpowered me. I voluntarily ſhut out the light, and felt a ſmall degree of pain. During this moment of darkneſs, I imagined that I had loſt the greateſt part of my being. I was then rouſed by a variety of ſounds. The ſinging of birds and the murmuring breezes formed a concert, which excited the moſt ſweet and enchanting emotions. I liſtened, and was convinced that theſe harmonious ſounds exiſted within me.—I made a ſtep forwards; and afterwards renewing my motion, I walked with my face turned towards the Heavens; till I ſtruck againſt a palm tree, and felt ſome degree of pain. Seized with terror, I ventured to lay my hand upon the object, and perceived it to be a being diſtinct from myſelf, becauſe it did not, like touching my own body, give me a double ſenſation. I reſolved then to feel every object I ſaw, and had a ſtrong deſire to touch the ſun; but ſtretching out my hands to embrace the Heavens, they met without any intermediate object. All objects appeared to me equally near, and it was not till after many trials that I learned to uſe my eye as a guide to my hand. At laſt the train of my ideas was interrupted, and I loſt the conſciouſneſs of my exiſtence. My ſleep was profound; but having no mode of meaſuring time, I knew nothing of its duration. When I awakened, I was aſtoniſhed to find by my ſide another form, perfectly ſimilar to my own. I conceived it to be another ſelf; and inſtead of loſing by my ſleep, I imagined myſelf to be doubled. I ventured to lay my hand upon this new being. With rapture and aſtoniſhment, I perceived that it was not myſelf, but ſomething much more glorious and deſirable." This philoſophical picture coincides with the opinion, that excepting what portions of knowledge Adam might acquire by the exerciſe of his ſenſes, his Maker taught him every thing that was neceſſary for his comfort and ſubſiſtence. But before the Almighty gave any inſtructions to our firſt parents, we muſt ſuppoſe he inſpired them with the knowledge of language and the meaning of words, otherwiſe it would ſeem to have been impoſſible that he could have had any ſuch communication with them. The words which they heard, and were made to underſtand, being imprinted on their memories, would ſerve as the foundation of a language, which they would afterwards increaſe and enlarge as new objects began to multiply, and hence give riſe to new terms and definitions. The neceſſity of food, for the ſupport of life, is ſuppoſed to have been one of the firſt leſſons taught to Adam by his infallible Director. Accordingly Moſes informs us, that for this purpoſe a grant was made him to eat of every tree of the garden, excepting one. In order to qualify him for ſocial intercourſe, he was ordered to exerciſe his faculty of ſpeech, by giving names to different creatures. Our talents, and the exerciſe of them, may be both ſaid to be given us of God; but whatever capacities we receive from him, it is ſuppoſed that we ourſelves muſt improve them, before we can attain to any acquirements whatever. Although Adam had heard and underſtood the words of God, yet Moſes does not give the leaſt hint, that he ever attempted to ſpeak before this time. For if he had, as ſome imagine, innate knowledge and proper terms for every thing preſented to him, what occaſion was there to bring animals before him to ſee what names he would impoſe upon them? Some writers have endeavoured to turn into ridicule the whole of this tranſaction, and have aſked, how could all creatures upon earth appear at one time before Adam; as not only one, but many days muſt have elapſed before he could give each a name? But, beſides that the text does not ſay how long time Adam took to this general review of the animals, the word in the original is in the ſingular number. "And whatſoever Adam called IT (viz. the living creature), that was the name of IT." The meaning ſeems to be this: God brought a few creatures to Adam, to make him try to name them; and whatever he called any of them, that continued to be its name. No doubt he would denominate every animal before him, from its

its external appearance, from its size, its colour, or its voice: And, consistently with this, the Hebrew language, which is supposed to have been the original one, is peculiarly expressive of such external qualities in the brute creation. The next thing in which God instructed Adam, though probably in a trance or vision, was his near relation to Eve, as being part of his own body. This piece of knowledge was imparted to him, in order to cement the greater love and affection between the two during the remaining period of their lives. These, according to Moses, are all the transactions in which our first parents were interested during their abode in Paradise. And it is evident, that the instructions which they received bespoke the infantile state of their minds; though doubtless higher dispensations of knowledge would have been communicated to them, as they became able to bear them, and had their minds matured by experience and reflection. How long our first parents retained their innocence, we are no where told. Many assert that they fell on the very first day of their creation. But Moses mentions so many transactions on that day, as must have engrossed the whole of their attention, and prevented them from falling into such temptations as arise from indolence and want of reflection. Besides, if, in such circumstances as they were placed, they could not have refrained from a violation of the divine law for one day it would have inferred a degree of folly or depravity in them even greater than in most of their posterity. It is somewhat singular, that many of the great trials recorded in sacred writing were limited to 40 days; which in prophetic style is sometimes equivalent to 40 years. This appears from the history of Moses, Elijah, of Nineveh, and of the Jewish nation after the death of Christ. And it is remarkable, that he, of whom Adam was a type, was tempted 40 days in the wilderness. Agreeable to this part of the Divine œconomy, perhaps the trial of our first parents lasted so long. However, that they remained for a considerable time in the garden appears highly probable from this consideration that their indulgent Creator who had manifested his tender concern for them while innocent, and extended his mercy to them when fallen, would never have turned them out of paradise, and sent them into an uncultivated world, before they had acquired the arts of living, and were capable of providing against the vicissitudes of their future lot. See FALL. Moses gives us no further account of Adam's life after leaving the garden, but that he begat some children, and died. Yet we have no reason to doubt, but the venerable patriarch ever after led a life of penitence and of the strictest piety. The births of Cain, Abel, and Seth, with the respective professions and sacrifices of the two former; the murder of Abel, and the flight of the murderer to the land of Nod; where he built the first city we have any authentic account of, are all that the sacred historian has recorded of the children of Adam. Confining this narrative chiefly to the line of Seth, from whence Noah and the whole postdiluvian race of mankind are descended, he has acquainted us with very few particulars relating to that of Cain; nor can we thus form any conjectures how long he or any of his descendants lived. All we know is, that Lamech, the fifth in descent from him, married two wives, which was the first known instance of polygamy: that by the one he had two sons, Jabal, the first that dwelt in tents, and fed cattle; and Jubal the inventor of music. and by the other, a son named Tubal-Cain, who discovered the art of forging and working metals; and a daughter named Naamah, supposed to have invented spinning and weaving; and we are told that Lamech having imitated the example of his progenitor, by murdering some person, made a speech to his wives the explication of which has greatly puzzled interpreters. See LAMECH. Moses proceeds to tell us, that Seth had a son born to him called *Enos*, and that "then began men to call upon the name of the Lord." Commentators give us three different senses of these words. Some think the words should be rendered, "Then men profaned in calling on the name of the Lord;" and that even Enos arrogated to himself a power, as if he had been a god. But this sense seems harsh and unnatural. There is nothing more unlikely, than that Adam's grandchildren, who lived under his own eye, would so soon shake off parental authority, and apostatise from the belief and worship of the one true God. Others think, that though men had hitherto worshipped God in private, yet they now instituted public assemblies, met in larger societies for solemn and social worship and introduced liturgies and forms for more effectually paying their homage to the Almighty. This indeed is a very natural comment from those who place religion in set *forms* of worship. But it is scarcely credible, that Adam and his family had never met together to worship God till now, when we are told that Cain and Abel, and probably both their families along with them, brought their offerings to the Lord: this they are supposed to have done every sabbath day. Others, therefore, put a more consistent interpretation upon the words, namely, that "men now called themselves by the name of the Lord: *q. d.* that about this period, the family of Seth, who adhered to God and his worship, began to give themselves a denomination, expressive of their relation and regards to him. They distinguished themselves from the irreligious family of Cain, and assumed the title of the *sons* or *children* of God: which designation was afterwards applied to them by Moses; it was even used after the flood, and adopted by the writers of the New Testament. Of the three next descendants of Seth, Cainan, Mahalaleel, and Jared, and of Methuselah and Lamech, the grandfather and father of Noah, Moses has recorded no more than their several ages. Enoch was a person of extraordinary piety, *walking with God*, as the Scripture expresses it, for at least the last 300 years of his life; as a reward for which exemplary behaviour in so corrupt an age, he was taken up by God into heaven, without tasting death. See ENOCH. Moses afterwards informs us, "When men began to multiply i. e. when the earth was filled with inhabitants, "Daughters were born unto them;" meaning, in greater abundance than formerly; which seems to hint, that at this period there were considerably more females than males born into the world,

Some

Some think that Moſes being now about to mention the wickedneſs of the Antediluvians, introduces the poſterity of Cain as being the chief cauſe of their corruption; and that he ſtyles them *men* and *daughters of men*, becauſe they were ſenſual and earthly, in which ſenſe the word *m n* is ſometimes uſed in the ſcriptures. Theſe words, "The ſons of God ſaw the daughters of men that they were fair; and they took them wives of all that they choſe," have given riſe to many ridiculous comments both of Jews and Chriſtians. Two interpretations may be mentioned as the moſt probable. When the name of God is added to any thing, it not only denotes being the efficient cauſe, but it heightens and increaſes its uſual meaning. For which reaſon any thing excellent in its kind, or uncommonly lofty, was by the Jews ſaid to be of God, or of the Lord. Thus the cedars of Lebanon are called the *cedars of the Lord*; and great mountains, the *mountains of God*. Therefore by the *ſons of God* in this place are meant men of great opulence, power, and authority. And by way of contraſt, the hiſtorian introduces thoſe of poor and mean circumſtances in life, and calls them the *daughters of men*. The words thus explained, are not an unlikely deſcription of that diſſolute age. The great and mighty in this world are commonly moſt addicted to ſenſual gratifications, becauſe they have ſo many incentives to inflame their paſſions, and ſo few reſtraints to curb them; and, inſtead of uſing their power to puniſh and diſcountenance vice, are too often the greateſt examples and promoters of laſciviouſneſs and debauchery. Thus, theſe *ſons of God*, theſe great men, when they happened to meet with the daughters of their inferiors, gazed on them as fit objects to gratify their luſt; and from among theſe they *took to themſelves*, in a forcible manner, *wives* or (as it may be rendered) *concubines, of all that they choſe*, whether married or unmarried, without ever aſking their conſent. No wonder then that the earth ſhould be *filled with violence*, when the higheſt ranks of men were above the reſtraint of law, reaſon and religion, and not only oppreſſed the poor, but with impunity treated them and their children in ſuch a baſe and tyrannical manner. But others cannot reliſh this interpretation, as they think it quite unſcriptural, to call great and powerful perſons the *ſons of God*, and all mean and plebeian women the *daughters of men*. Beſides, the text does not ſay, that the ſons of God offered any violence to theſe inferior women; but that they ſaw that they were *fair*, and made choice of them for wives. And they juſtly argue, that there is no moral turpitude in men of ſuperior rank or riches, marrying their inferiors: and therefore it is abſurd to ſuppoſe ſuch unequal matches, among the rich and poor, children of the ſame common parent, a ſufficient cauſe for bringing upon the world an univerſal deſtruction. For theſe reaſons many are of opinion, that the deſcendants of Seth, who were ſtyled the *ſons of God*, on account of their ſuperior ſanctity, fell in love with the *daughters of men*, the impious progeny of Cain, and by intermarriages became aſſociated with them; and ſurrendering to thoſe inchantreſſes their hearts and their freedom, they ſurrendered at the ſame time their virtue and their religion. From this union proceeded effects ſimilar to what has happened ever ſince. When a pure ſociety mixes with a profane, the good principles of the one ſoon become tainted by the bad practices of the other, and thus it is probable, that the great ſource of univerſal degeneracy was owing to the poſterity of Seth mingling with the progeny of Cain, in oppoſition to what their pious father had ſtrictly charged them. Moſes next tells us, that "there were giants in thoſe days," and that the products of theſe marriages were "mighty men, and men of renown." Tranſlators are not agreed about the meaning of the word *giants*. Some render the word, *violent and cruel men*; others, men who *fall upon* and *ruſh forward*, as a robber does upon his prey: the meaning then is, that they were not more remarkable for their ſtrength and ſtature, than for their violence and cruelty. It is generally agreed, that in the firſt ages of the world, men were of a gigantic ſtature; though Moſes does not mention them as giants till after the union of the families of Seth and Cain, when men uſed their ſuperiority in bodily ſtrength for the purpoſes of gratifying their worſt paſſions. At this period of the world, and long after, political power and bodily ſtrength went hand in hand. Whoever was able to encounter a fierce wild beaſt and clear the country of noxious animals, or in the day of battle to deſtroy moſt of his enemies, was looked up to by the reſt of his companions as the fitteſt to be their commander. Thus, Nimrod, from being a *mighty hunter*, became a great monarch, and it appears from hiſtory, that all his ſucceſſors have pretty nearly trodden in the ſame path. Theſe *giants*, then, might be the chief warriors, who formed themſelves into choſen bands, and living among a cowardly and effeminate people, had no curb to their cruelty and luſt. From them might ſpring an illegitimate race, reſembling their fathers in body and mind, who, when they grew up, having no inheritance, would be turned looſe upon the world, and follow no other employment but rapine and plunder. Thus they became *mighty men* and *men of renown, and procured themſelves a name*, by the ſame means, that moſt heroes have procured a name in hiſtory; by the miſchiefs they did, and the numbers of their fellow mortals whom they murdered. Mankind running thus headlong into all manner of vice, were admoniſhed to repent; for which purpoſe, they were not only allowed ſufficient ſpace, (120 years) but repeatedly warned by Noah, who is deſcribed by the Apoſtle Peter, as a preacher of righteouſneſs; and who alone, amidſt this general corruption, was found to be juſt and perfect in his generation. But all he could do was to no purpoſe. They continued incorrigibly obſtinate; ſo that at length, (as Joſephus tells us,) finding himſelf and family in imminent danger of perſonal violence, he departed from among them, with his wife and children. This is extremely probable; for Moſes aſſures us, "that the wickedneſs of man was great in the earth, that every imagination of the thoughts of his heart was continually evil;" and that "the earth was corrupt and filled with violence, all fleſh having corrupted his way upon the earth." Theſe words leave no room

room to enquire into the particular crimes of the antediluvian world, which ſeems to have been over-run with a complication of all manner of debauchery and wickedneſs, and above all with violence, injuſtice and cruelty towards one another. In this ſtate of univerſal depravity, the Almighty reſolved to extirpate the whole human race, excepting Noah and his family, whom he directed how to preſerve themſelves from univerſal deſtruction. See DELUGE.

(7.) ANTEDILUVIANS, JEWISH TRADITIONS CONCERNING THE. As to any further tranſactions before the flood, we are left entirely in the dark by the ſacred hiſtorian. The Jews and eaſtern nations, however, have made ample amends for the ſilence of Moſes, by the abundance of their traditions. The only part of theſe, which can be connected in any thing like hiſtory, is what follows. After the death of Adam, Seth with his family ſeparated themſelves from the profligate race of Cain, and choſe for their habitation the mountain where Adam was buried, the Cainites remaining below in the plain where Abel was killed; and, according to theſe hiſtorians, this mountain was ſo high, that the inhabitants could hear the angels ſinging the praiſes of God, and even join them in that ſervice!!! Here they lived in great purity and ſanctity of manners. Their conſtant employment was praiſing God, from which they had few or no avocations; for their only food was the fruits of the trees which grew on the mountain, ſo that they had no occaſion to undergo any ſervile labours, nor the trouble of ſowing and gathering in their harveſt. They were utter ſtrangers to envy, injuſtice, or deceit. Their only oath was, "By the blood of Abel;" and they every day went up to the mountain to worſhip God, and to viſit the body of Adam, as a mean of procuring the Divine bleſſing. Here, by contemplation of the heavenly bodies, they laid the foundations of the ſcience of aſtronomy; and, leſt their inventions ſhould be forgotten, or loſt before they were publicly known, underſtanding, from a prediction of Adam's, that there would be a general deſtruction of all things, once by fire, and once by water, they built two pillars, one of brick, and the other of ſtone, that if the brick one happened to be overthrown by the flood or otherwiſe deſtroyed, that of ſtone might remain. This laſt, Joſephus ſays, was to be ſeen in his time in the land of Siriad, thought to be in Upper Egypt. The deſcendants of Seth continued in the practice of virtue till the 40th year of Jared, when 100 of them hearing the noiſe of the muſic and the riotous mirth of the Cainites, agreed to go down to them from the holy mountain. On their arrival in the plain, they were immediately captivated by the beauty of the women; who were naked, and with whom they defiled themſelves; and this is what is meant by the intermarriage of the ſons of God with the daughters of men, mentioned by Moſes. The example of theſe apoſtate ſons of Seth was ſoon followed by others; and from time to time great numbers continued to deſcend from the mountain, who in like manner took wives from the abandoned race of Cain. From theſe marriages ſprung the giants, who being as remarkable for their impiety as for their ſtrength of body, tyrannized in a cruel manner, and polluted the earth with wickedneſs of every kind. This defection became at laſt ſo univerſal, that none were left in the holy mountain, except Noah, his wife, his three ſons and their wives.

(8.) ANTEDILUVIANS, PROFANE HISTORY OF THE. The heathens have been no leſs fruitful in invention, than the Jews, in filling up the chaſms of the Antediluvian hiſtory. Beroſus, a Chaldean hiſtorian, who flouriſhed in the time of Alexander the Great, enumerates 10 kings who reigned in Chaldæa before the flood; of whom the firſt, called *Alorus*, is ſuppoſed to be Adam, and Xiſuthrus, the laſt, to be Noah.—This Alorus declared that he held his kingdom by divine right, and that God himſelf had appointed him to be the paſtor of the people. According to our hiſtorian, in the firſt year of the world, there appeared out of the Red Sea, at a place near the confines of Babylonia, a certain *rational* animal called *Oannes*. He had his whole body like that of a fiſh; but beneath his fiſh's head grew another of a different ſort, probably a human one. He had alſo feet like a man, which proceeded from his fiſh's tail, and a human voice. This animal converſed with mankind, in the day time, without eating any thing: he delivered to them the knowledge of letters, ſciences, and various arts: he taught them to dwell together in cities, to erect temples, to introduce laws, and inſtructed them in geometry: he likewiſe ſhowed them how to gather ſeeds and fruits, and imparted to them whatever was neceſſary and convenient for a civilized life; but after this time there was nothing excellent invented. When the ſun ſet, Oannes retired into the ſea, and continued there all night. He not only delivered his inſtructions by word of mouth, but, wrote of the origin of things, and of political œconomy. This, or a ſimilar animal, is alſo mentioned by other authors. Of Alaſporus, the ſecond king, nothing remarkable is related. His ſucceſſor, Amelon, or Amillarus, was of a city called *Pantabibla*. In his time another animal reſembling the former appeared, 260 years after the beginning of this monarchy. Amelon was ſucceeded by Metalarus; and he by Daonus, all of whom were of the ſame city. In the time of the latter, four animals of a double form, half man and half fiſh, made their appearance. Their names were *Enedocus*, *Eneugamus*, *Encubulus*, and *Anmentus*. Under the next prince, who was likewiſe of Pantabibla, appeared another animal of the ſame kind, whoſe name was *Odacon*. All theſe explained more particularly what had been concifely delivered by Oannes. In the reign of the tenth king, Xiſuthrus, happened the great deluge, of which our author gives the following account: Cronus, or Saturn, appeared to Xiſuthrus in a dream, and warned him, that on the 15th of the month Dæſius mankind would be deſtroyed by a flood; and therefore commanded him to write down the original, intermediate ſtate, and the end of all things, and bury the writings under ground at Sippara, the city of the ſun; that he ſhould alſo build a ſhip, and go into it with his relations and deareſt friends, having firſt furniſhed it with proviſions, and taken into it fowls and four-footed beaſts;

and that, when he had provided every thing, and was asked whither he was sailing, he should answer, *To the gods, to pray for happiness to mankind.* Xisuthrus did not disobey; but built a vessel, whose length was five furlongs, and breadth two furlongs. He put on board all he was directed; and went into it with his wife, children, and friends. The flood being come, and soon ceasing, Xisuthrus let out certain birds, which finding no food, nor place to rest upon, returned again to the ship. Xisuthrus, after some days, let out the birds again; but they returned to the ship, having their feet daubed with mud: but when they were let go the third time, they came no more to the ship, whereby Xisuthrus understood that the earth appeared again; and thereupon he made an opening between the planks of the ship, and seeing that it rested on a certain mountain, he came out with his wife, and his daughter, and his pilot; and having worshipped the earth, raised an altar, and sacrificed to the gods, he and those who went out with him disappeared. They who were left behind in the ship, finding that Xisuthrus and the persons that accompanied him did not return, went out themselves to seek for him, calling him aloud by his name; but Xisuthrus was no more seen by them: only a voice came out of the air which enjoined them, as their duty was, to be religious; and informed them, that on account of his own piety he was gone to dwell with the gods, and that his wife and daughter and pilot, were partakers of the same honour. It also directed them to return to Babylon, and that, as the fates had ordained, they should take the writings from Sippara, and communicate them to mankind; and told them, that the place where they were was the country of Armenia. When they had heard this, they offered sacrifice to the gods, and unanimously went to Babylon; and when they came thither, they dug up the writings at Sippara, built many cities, raised temples, and rebuilt Babylon. The Egyptians, who would give place to no nation in point of antiquity, have also a series of kings, who, it is pretended, reigned in Egypt before the flood; and, to be even with the Chaldeans, began their account the very same year that theirs does according to Berosus. There was an ancient chronicle extant among the Egyptians, not many centuries ago, which contained 10 dynasties of princes, who ruled in that country, by a series of 113 generations, through an immense space of 36,525 years, during which Egypt was successively governed by three different races; of whom the first were the Auritæ, the second the Mestræi, and the third the Egyptians. But this extravagant number of years Manetho (to whose remains we must chiefly have recourse for the ancient Egyptian history) has not adopted, however in other respects he is supposed to have been led into errors in chronology, by this old chronicle, which yet seems to have been a composition since Manetho's time. The account given by Berosus, if not taken from the writings of Moses, is at least founded upon some traditional account of the same facts; and in that view, might be held as a sort, of corroborative evidence of their authenticity if they needed any. But we have another account of the first ages of mankind, in which no mention is made of the flood at all. This is contained in some fragments of a Phœnician author, called *Sanchoniatho*, who is said by some to have been cotemporary with Gideon, by others to have lived in the days of king David; while some boldly assert there never was such a person, and that the whole is a fiction of Philo-Biblius, in opposition to the books of Josephus written against Apion; which is extremely probable.

(9.) ANTEDILUVIANS, STATE OF THE ARTS, &c. AMONG THE. Of the customs, policy, and other general circumstances of the Antediluvians, we can only form conjectures. All that we know even of their religious rites, is, that they offered sacrifices very early, both of the fruits of the earth, and of animals; but whether the blood and flesh of the animals, or only their milk and wool, were offered, is a disputed point. Of their arts and sciences, we have not much more to say.—The Antediluvians seem to have spent their time rather in luxury and wantonness, to which the abundant fertility of the first earth invited them, than in discoveries or improvements, which probably they stood much less in need of, than their successors. The art of working metals was found out by the last generation of Cain's line; and music, which they might be supposed to practice for their pleasure, was not brought to any perfection, before the same generation. Some authors have supposed astronomy to have been cultivated by the Antediluvians, though this is probably owing to a mistake of Josephus: but it is to be presumed, the progress they made therein, or in any other science, was not extraordinary; it being even very doubtful, whether letters were so much as known before the flood. See ALPHABETICAL CHARACTERS, § 2, 3. As to their politics and civil constitutions, we have no so much as one circumstance, whereon to build conjecture. It is probable, the patriarchal form of government, which doubtless was the first, was set aside, when tyranny and oppression began to take place, and much sooner among the race of Cain, than that of Seth. It seems also, that the communities were but few, and consisted of vastly larger numbers of people than any formed since the flood; or rather, it is a question, whether, after the union of the two great families of Seth and Cain, there were any distinction of civil societies, or diversity of regular governments, at all. It is more likely, that all mankind then made but one great nation, though living in a kind of anarchy, divided into several disorderly associations; which, as it was almost the natural consequence of their having, in all probability, but one common language, so it was a circumstance which greatly contributed to this general corruption, which otherwise perhaps could not have universally overspread the Antediluvian world. And for this reason chiefly, as it seems, so soon as the posterity of Noah were sufficiently increased, a plurality of tongues was introduced, in order to divide them into distinct societies, and thereby prevent any such total depravation for the future. See CONFUSION OF TONGUES. Of the peaceful and happy condition of the Antediluvians, as well as of their virtuous and harmonious

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manner of life, Mr Whithurſt, in his *Inquiry into the original State and Formation of the Earth*, (p. 182, 183,) had drawn a picture, ſimilar to that which the poets have given of the golden age.—But our ingenious author, whoſe *Inquiry* is not profeſſedly repugnant to revelation, has forgot to inform us, For what purpoſe, under ſuch circumſtances, the deluge was ſent; and, How we are to underſtand the account given by Moſes, who repreſents the Antediluvians, not as an innocent race, quietly repoſing on the ever-verdant turf; but as a corrupt generation, by whom "the earth was filled with violence." Much has been wrote upon the queſtion, whether the Antediluvians uſed animal food, or not. As it is a queſtion of little importance, and upon which nothing certain can be determined on either ſide, we ſhall not enter upon it, farther, than juſt to obſerve, that we think the probability is in favour of the affirmative; as it is ſcarce credible, that the Antediluvians would ſhow any mercy to the brute creation, when they did not ſpare each other.—Nay, it is even not improbable, that the Antediluvians, along with their other corruptions, had become ſo groſsly barbarous, as to eat the *living fibres*, like the ABYSSINIANS, (ſee that article,) which perhaps was the reaſon of the prohibition given to Noah, Gen. ix. 4. againſt eating *fleſh with the life thereof*, along with the general permiſſion to eat animal food.

(10.) ANTEDILUVIANS, VAST LONGEVITY OF THE, ACCOUNTED FOR. One of the moſt extraordinary circumſtances, which occurs in the antediluvian hiſtory, is the vaſt length of human lives in thoſe firſt ages, in compariſon with our own. Few perſons now arrive at 80 or 100 years; whereas, before the flood, they frequently lived to near 1000, a diſproportion almoſt incredible, though ſupported by the joint teſtimonies of ſacred and profane writers. Some, to reconcile the matter with probability, have imagined, that the ages of thoſe firſt men might poſſibly be computed, not by ſolar years, but months; an expedient which reduces the length of their lives rather to a ſhorter period than our own. But for this, there is not the leaſt foundation; beſides, the many abſurdities that would thence follow, ſuch as their begetting children at about ſix years of age, as ſome of them in that caſe muſt have done, and the contraction of the whole interval between the creation and the deluge to conſiderably leſs than 200 years, even according to the larger computation of the Septuagint. Joſephus, and ſome Chriſtian divines, are of opinion, that before the flood, and ſome time after, mankind in general, did not live to ſuch a remarkable age, but only a few beloved of God, ſuch as the patriarchs mentioned by Moſes. They reaſon in this manner: Though the hiſtorian records the names of ſome men, whoſe longevity was ſingular, yet that is no proof that the reſt of mankind attained to the ſame period of life, more than that every man was then of a gigantic ſtature, becauſe he ſays *in thoſe days there were giants upon the earth*. Beſides, had the whole of the Antediluvians lived ſo very long, and increaſed in numbers in proportion to their age, before the flood of Noah, the earth could not have contained its inhabitants, even ſuppoſing no part of it had been ſea. Hence they conclude, that God extended only the lives of the patriarchs, to ſuch an extraordinary length. But moſt writers maintain the longevity of mankind in general in the early world, not only upon the authority of ſacred, but likewiſe of profane hiſtory. And for ſuch a conſtitution, the moral reaſons are abundantly obvious. When the earth was wholly unpeopled, except by one pair, it was neceſſary to endow men with a ſtronger frame, and to allow them a longer continuance upon earth, for peopling it with inhabitants. In the infant ſtate of every mechanical art, relating to tillage, building, clothing, &c. it would require many years experience, to invent proper tools and inſtruments to eaſe men of their labour, and by multiplied eſſays and experiments to bring their inventions to any degree of maturity and perfection. Every part of their work muſt have been exceedingly arduous from ſuch a penury and coarſeneſs of tools, and muſt have required longer time, and more ſtrength of body than afterwards, when mechanical knowledge was introduced into the world. If parents at this period had not continued long with their children, to have taught them the art of providing for themſelves, and have defended themſelves from the attacks of wild beaſts, and from other injuries to which they were expoſed, many families would have been totally extinguiſhed. But one of the beſt and moſt valuable ends which longevity would anſwer was, the tranſmitting of knowledge, particulary of religious knowledge to mankind. And thus, before writing was invented, or any ſuch eaſy and durable mode of conveyance was found out, a very few men ſerved for many generations to inſtruct their poſterity, who thus would not be at a loſs to conſult living and authentic records. The natural cauſes of this longevity are variouſly aſſigned. Some have imputed it to the ſobriety of the Antediluvians, and the ſimplicity of their diet; alleging, that they had none of thoſe provocations to gluttony, which wit and vice have ſince invented. Temperance might undoubtedly have ſome effect, but not poſſibly to ſuch a degree. There have been many temperate and abſtemious perſons in later ages, who yet ſeldom have exceeded the uſual period. Others have thought, that the long lives of thoſe inhabitants of the old world proceeded from the ſtrength of their ſtamina, or firſt principles of their bodily conſtitutions: which might, indeed, be a concurrent, but not the ſole and adequate cauſe of their longevity; for Shem, who was born before the deluge, and had all the virtues of the antediluvian conſtitution, fell 300 years ſhort of the age of his forefathers, becauſe the greateſt part of his life was paſſed after the flood. Others have imputed the longevity of the Antediluvians to the excellency of their fruits, and ſome peculiar virtue in the herbs and plants of thoſe days. But to this ſuppoſition, it has been objected, that as the earth was curſed, immediately after the fall, its productions, we may ſuppoſe, gradually decreaſed in their virtue and goodneſs, till the flood; and yet, we do not ſee the length of men's lives decreaſed conſiderably, if at all, during that inter-

val. Waving this objection, as the import of the curſe is variouſly interpreted, it appears certain, that the productions of the earth were at firſt, and probably continued, till after the deluge, of a different nature, from what they were in future times. Buffon ſuppoſes their difference may have continued gradually to diminiſh, for many ages ſubſequent to that cataſtrophe. The ſurface of the globe, (according to his theory,) was, in the firſt ages of the world, leſs ſolid and compact; becauſe, gravity having acted only for a ſhort time, terreſtrial bodies had not acquired their preſent denſity and conſiſtence.—The produce of the earth therefore, muſt have been analogous to its condition. The ſurface being more looſe and moiſt, its productions would of courſe be more ductile and capable of extenſion: Their growth, therefore, and even that of the human body, would require a longer time of being completed. The ſoftneſs and ductility of the bones, muſcles, &c. would probably remain for a longer period, becauſe every ſpecies of food was more ſoft and ſucculent. Hence, the full expanſion of the human body, or when it was capable of generating, muſt have required 120 or 130 years; and the duration of life would be in proportion to the time of growth, as is uniformly the caſe at preſent: For if we ſuppoſe the age of puberty, among the firſt races of men, to have been 130 years, as they now arrive at that age in 14 years, the age of the Antediluvians will be in exact proportion to that of the preſent race; ſince by multiplying theſe two numbers by ſeven, for example, the age of the preſent race will be 90, and that of the Antediluvians will be 910. The period of man's exiſtence, therefore, may have gradually diminiſhed in proportion as the ſurface of the earth acquired more ſolidity by the conſtant action of gravity: and it is probable, that the period from the creation, to the days of David, was ſufficient to give the earth all the denſity it was capable of receiving from the influence of gravitation; and conſequently that the ſurface of the earth has ever ſince remained in the ſame ſtate, and the terms of growth in the productions of the earth, as well as the duration of life, have been invariably fixed from that period. It has been further ſuppoſed, that a principal cauſe of the longevity under conſideration was the wholeſome conſtitution of the Antediluvian air, which, after the deluge, became corrupted and unwholeſome, breaking, by degrees, the priſtine craſis of the body, and ſhortening men's lives, in a very few ages, to near the preſent ſtandard. The temperature of the air and ſeaſons before that cataſtrophe are upon very probable grounds ſuppoſed to have been conſtantly uniform and mild: the burning heats of ſummer and the ſeverities of winter colds were not then come forth, but ſpring and autumn reigned perpetually together: And indeed, the circumſtance above all others moſt conducive to the prolongation of human life in the poſtdiluvian world appears to be an equal and benign temperature of climate, (ſee LONGEVITY); whence it ſeems reaſonable to infer, that the ſame cauſe might have produced the ſame effect in the Antediluvian world.

(11.) ANTEDILUVIANS, VAST PROBABLE NUMBERS OF. It is highly probable that, the Antediluvian world was ſtocked with a much greater number of inhabitants than the preſent earth either actually does, or perhaps is capable of containing or ſupplying. This ſeems naturally to follow from the great length of their lives, which exceeding the preſent ſtandard of life in the proportion, at leaſt, of ten to one, the Antediluvians muſt accordingly in any long ſpace of time double themſelves, at leaſt in about the tenth part of the time in which mankind do now double themſelves. It has been ſuppoſed that they began to get children as early, and left off as late, in proportion as men do now; and that the ſeveral children of the ſame father ſucceeded as quickly one after another as they uſually do at this day; and as many generations, which are but ſucceſſive with us, were contemporary before the flood, the number of people living on the earth at once would be by that means ſufficiently increaſed to anſwer any defect which might ariſe from other circumſtances not conſidered. So that, if we make a computation on theſe principles, we ſhall find, that there was a conſiderable number of people in the world at the death of Abel, though their father Adam was not then 130 years old; and that the number of mankind before the deluge would eaſily amount to above one hundred thouſand millions (even according to the Samaritan chronology), that is, to twenty times as many as our preſent earth has, in all probability, now upon it, or can be well ſuppoſed capable of maintaining in its preſent conſtitution. The following table drawn up on theſe principles by Mr Whiſton, ſhews what numbers of people probably were in the Antediluvian world.

Number of mankind.	Year of the world.	Year of doubling.	Series.
4	2	2	1
8	6	4	2
16	12	6	3
32	20	8	4
64	30	10	5
128	42	12	6
256	56	14	7
512	72	16	8
1024	90	18	9
2048	110	20	10
4096	132	22	11
8192	156	24	12
16,384	182	26	13
32,768	210	28	14
65,536	240	30	15
131,072	272	32	16
262,144	306	34	17
524,288	342	36	18
1,048,576	380	38	19
2,097,152	420	40	20
4,194,304	462	42	21
8,388,608	506	44	22
16,777,216	552	46	23
33,554,432	600	48	24
67,108,864	650	50	25
134,217,728	702	52	26
268,435,456	756	54	27
536,870,912	812	56	28

Series

Number of mankind.	Years of the world.	Years of doubling.	Series.
1,073,741,824	870	58	29
2,147,483,648	930	60	30
4,294,967,296	992	62	31
8,589,934,592	1056	64	32
17,179,869,184	1122	66	33
34,359,738,368	1190	68	34
68,719,476,736	1260	70	35
137,438,953,472	1332	72	36
274,877,906,944	1406	74	37
549,755,813,888	1482	76	38

(12.) ANTEDILUVIANS, VAST PROBABLE NUMBERS OF, ACCORDING TO MR COCKBURN. To the above calculations of Mr Whiſton's, Mr Cockburn in his *Treatiſe upon the Deluge*, makes the following objections. "1. It is laid down as a foundation, that the Antediluvians would double themſelves every 40 years; as indeed they would, and in leſs time after there came to be 100 marriages. Now, had the author obſerved this regular progreſſion in his computation, by adding 40 years to every former period of the age of the world, the amount, inſtead of two millions of millions, &c. would have been above five millions of millions at the year 1656, the age of the world at the deluge, according to the Hebrew numbers which he contends for. What would the ſum then have been, had we carried on the computation for 600 years more according to the Septuagint? 2. He ſuppoſes the period of doubling muſt have been much ſhorter in the earlieſt ages, and much longer in the later, contrary to reaſon and fact. For mankind being ſprung from one pair only, the increaſe at firſt muſt have been very ſlow, but come on very faſt when a conſiderable number were married. His table therefore is made not regularly, but according to fancy, by unequal ſtarts or chaſms, at great intervals in the later part, where it ſhould have been moſt regular; it would ſeem with no other view than to raiſe ſuch a number, upon the whole, as might be thought ſufficient to people the earth. 3. In that calculation the two material points, the time of nurſing, and the age of puberty, are quite overlooked, by which all computations of the numbers in the Antediluvian world muſt be regulated. What unavoidable miſtakes this omiſſion muſt occaſion, will be ſeen by examining the firſt ten numbers of Mr Whiſton's table (§ 11.) On this table it may be obſerved, 1. That though there were but two perſons created at firſt, this computation makes four perſons in the ſecond year of the world. This could not poſſibly be, except Cain had been born within 12 months after the creation, which is highly improbable, and Abel in the ſecond year, yet far more improbable; for in that caſe Eve could not have ſuckled Cain. 2. In the 6th year of the world we have 8 perſons, that is, 6 children of Eve's in ſix years. "But, ſays Mr Cockburn, what ſhall Eve do with 6 infants in 6 years? Where could ſhe find ſo many wet nurſes for them? or would the mother of all living deny her children that nouriſhment which the Creator had appointed for their firſt food, the milk in her breaſts? Do they conſider that there was but one woman in the world to do for herſelf, her huſband and her children, what belongs to women to do? We ſhould ſurely have more compaſſion for the mother of all mankind, than to lay ſuch an intolerable burden upon her, whoſe ſorrow for her own deception, and thereby ruining both herſelf and her huſband, muſt have been very great for many years. In puniſhment of which, though God had ſaid "he would greatly multiply her ſorrow and conception," the meaning was not, that ſhe ſhould have a child every year, which could not be, becauſe the nature of that food and nouriſhment appointed by himſelf for her children would not permit it. Nor yet when he commanded them to "increaſe and multiply and repleniſh the earth," could the command be obeyed in ſuch a manner as was contrary to the order of nature and providence. But the method intended to anſwer the deſign of the command was to prolong their lives to above 800 and 900 years, and their prolific powers for 340 or 360 years of that term of life, that by ſlow and ſure and long continuance of increaſe they might people the earth in due time." 3. The ſame exception lies to all the following periods of doubling, where the number far exceeds what it could poſſibly be in fact; but we ſhall paſs them over, and come to the laſt of them in the year 110, in which the number of mankind is made 2048. Now in the year 110 none of Adam's children were married, becauſe not yet come to the age of puberty. In that year of the world there could be no more than 18 or 20 perſons, at ſingle births, beſides Adam and Eve. It is a great miſtake therefore to imagine that the periods of doubling were much ſhorter in the earlier times than in the later: the contrary of which is evident to reaſon. According to Mr Cockburn, two errors have been fallen into in treating of this point; namely, 1. That in the firſt ages of the world, both before and after the flood, men began to propagate as early as they commonly do at preſent. 2. That the children of the ſame father ſucceeded one after another as faſt as they do now, that is, that the women brought forth children every year. The firſt of theſe errors he confutes, by ſhowing that the ſeveral periods or ſtages of man's life bear a juſt proportion to one another, and to the whole term of life; and that the period of puberty or maturity has not been the ſame at all times, but is according to the length or brevity of life in the different ages of the world. Moſes, he obſerves, gives the age of the world from the creation to the deluge, and from that period to his own time chiefly by generations. A generation is the interval of years between the births of father and ſon. Now, a generation, or the interval of years between father and ſon, has not been, neither poſſibly could be, the ſame in all ages from the beginning; but has varied greatly according to the length or brevity of man's life in the ſeveral periods of the world. Since the ordinary term of man's life has been reduced to 70 or 80 years, the time of puberty is in proportion to this brevity of life, and reckoned at 20 or 21, which is the fourth part of a life of fourſcore. The ſeveral ſtages of human life, are infancy, childhood, youth, manhood, full age, declenſion, old or decrepit age; all

all which commonly bear a proportion to the whole term of life. Now the limits of theſe ſeveral ſtages cannot be preciſely the ſame in all, but vary in reſpect of the diſpoſitions of men's bodies, their courſe of life, and alſo the places and ages in which they live. In the Antediluvian world then, when men lived to upwards of 800 and 900 years, can it be thought that they paſſed through the ſeveral ſtages of life in as ſhort a time as men do now, who ſeldom exceed 80, and not one in ten arrives at that age? But if the Antediluvians arrived at puberty as ſoon as men do now, then would the ſeveral ſtages of human life have been loſt or confounded, and men would have ſtarted from childhood to manhood at once, without any due or regular intervals, contrary to the order of nature: But if, according to the preſent œconomy of nature, man is but a youth at 20, which is a fourth part of our term of life, we may reaſonably conclude, there would be a ſuitable proportion of years in a much longer term of life, ſince nature is conſtant and uniform in her operations. And though in ſo long a life as the Antediluvians enjoyed, the time of puberty might be a fifth or a ſixth part of their term of life, yet would they be but youths at 150 or 160; which bears much the ſame proportion to the whole of their life as twenty is to that of ours. The other is an error, he thinks, which could never have been fallen into, had it been conſidered, that every mother ſuckled her own children in thoſe early days; and indeed where could ſhe have found another to have done it for her? Taking it for granted, then, that it was an univerſal cuſtom for women to ſuckle their children as well before as after the flood, the next queſtion is, for how long time they continued nurſes? He ſhows various inſtances, that when man's life was reduced to 130 or 140 years, the ordinary time of nurſing was two years: he thence infers, that for three or four generations after the flood, when men lived to above 400 years, the time would be ſo much longer in proportion, and would not be leſs than three or four years; and conſequently, that before the flood, when life was protracted to 800 or 900 years, it would be ſtill longer in proportion to their longevity: ſo that five years might be the ordinary time of nurſing in the Old World; and therefore that we cannot reckon leſs than ſix years between the births. For man's life being prolonged to ſo many hundred years at firſt for the more ſpeedy peopling of the earth, he came by ſlow degrees to mature age, there being a long time required to rear up a body that was to laſt near 1000 years. The intervals therefore of infancy, childhood, youth, and mature age, were ſo much longer in proportion to ours, as the difference is between our term of life and theirs; and 150 or 160 years, with reſpect to their longevity, was no more in proportion than 20 is to the brevity of our life. As the Antediluvians therefore were ſo very long in growing up to mature age, he concludes that the time of nurſing could not be ſhorter than five years, and that the diſtance between the births in a regular way muſt be ſet at ſix years. Upon the whole, he thinks it evident that there could be no ſuch ſpeedy increaſe of mankind at the beginning as is imagined; that the time of nurſing above ſpecified was no more than neceſſary for that ſtrength of conſtitution which was to laſt for 800 or 900 years; and that women who were to continue bearing children for 340 or 360 years of their life, ſhould have them but ſlowly, and at the diſtance of ſeveral years, that their ſtrength might hold out, and that they might not be overburthened with too many cares at once; and therefore, when Eve's firſt child was ſix years old, it was time enough for her to have another, and ſo on, though poſſibly ſometimes twins." He then proceeds, 1. "To compute what number upon the whole might be born into the world from the creation to near the time of the deluge; and then, 2. To ſtate the needful deductions for deaths and other deficiencies. 1. How long the parents of mankind continued in paradiſe, we know not; though longer perhaps than is commonly imagined. We ſhall even ſuppoſe 2 or 3 years, in which time there was no child born, nor any attempt towards it. We ſhall allow them 2 or 3 years more to lament their fall, and the miſerable eſtate their want of faith and diſobedience had brought them to, from a moſt happy condition; and ſuppoſe Cain to be born ſix years after the creation (in which ſuppoſition few, probably, will be apt to think us too haſty, and Abel again ſix years after him, and ſo every ſixth year Eve to have had a child, the firſt ſeven, eight or nine whereof were probably all males (the males being longer in coming to maturity than the females;) and this diſtance between the births will alſo be thought a ſufficient allowance. At this rate of increaſe, Adam would have in 100 years 16 children, in 200 years 32, and in 400 years 64 children; when we will ſuppoſe Eve to have left off child bearing. Nor need this number of Adam's children be thought too great, when there are inſtances in theſe later ages, and this ſhort period of man's life, of thoſe who have had 40 children at ſingle births by two ſucceſſive wives, and of many others who have had 20, 25, and 30, by one wife; though in ſuch caſes it is not to be ſuppoſed that the women ſuckled their children. 2. Though it is reaſonable to think that the Antediluvians, notwithſtanding their longevity, came to mature age at 150; yet as we are not ſure that they all married ſo ſoon as they were ripe for marriage, and that the earlieſt in the genealogies is born in the 162d year of his father, who might probably be a firſt-born, our author does not ſuppoſe Cain, Abel, or any of the ſucceeding children or grand-children of Adam to have married till they were 160, but to have had children from 161 or 162 till they were of the age of 500, at the fore-named diſtance or interval between the births; though Noah every body knows, had three ſons after he was 500, at the due intervals. And to all the Antediluvians we may allow, without fear of exceeding, 50 or 54 children in general, according to the courſe of nature, and the longevity of thoſe firſt ages of the world. 3. Let us next inquire in what number of years the men of that world might double themſelves, notwithſtanding the long interval between the births. The increaſe indeed will be found very ſmall for the firſt 300 or 400 years, as they were late in coming to maturity; but the

ſucceeding ages will ſwell the account exceedingly. Let us ſuppoſe, that in the year of the world 500, there were 200 perſons only, male and female, of full age to marry, the men 160, the women at 120 or thereabout. The firſt or ſecond year after the marriage will in all probability produce 100 births from 100 couple, and every ſixth year after 100 more. At this ſlow progreſſion the 200 married perſons will, in 19 or 20 years, be increaſed to 600: ſo that the number of mankind would be trebled in 20 years, after 100 pair were married. And in this manner they would increaſe and multiply every 20 years, or in that ſpace treble themſelves; For although none of the iſſue of theſe 100 firſt marriages could increaſe the number of mankind till the men had attained the age of 160; yet the firſt 100 pair are ſtill adding every ſixth year 100 more to the number of mankind, even till after the 400 born in the firſt 20 years are married, and begin a new ſtock for increaſe: ſo that when there came to be ſome hundred couples married, the increaſe and multiplication would come on very faſt, and in 1000 years mankind would be prodigiouſly increaſed. But though, after the year 500, they might treble themſelves in 20 years; yet we will not reckon upon ſo ſhort an interval, but will allow a much longer time even to their doubling themſelves. and ſhall exhibit two tables of doubling; the firſt at the interval of 50 years, much too long indeed, the other at the interval of 40 years, and both beginning at the year 500, when there could not be fewer (whatever more there might be) than 100 married perſons deſcended from Adam and Eve. The firſt of theſe tables, is brought down no lower than to the year 2050, and the ſecond to the year 2020, though there remain by the firſt 206, and by the ſecond 236 years to the flood: the reaſon is, that in thoſe laſt 200 years of the world, mankind would not increaſe in any meaſure equal to what they had done in the preceding years, (though regularly the increaſe ſhould have been much greater;) becauſe violence was then great in the earth, and thouſands, yea millions, might have been cut off by untimely deaths; for which cauſe the world's deſtruction was determined 120 years before the flood came.

TABLE I.

Years of the World.	*Number of Mankind.*
500	200
550	400
600	800
650	1,600
700	3,200
750	6,400
800	12,800
850	25,600
900	51,200
950	102,400
1,000	204,800
1,050	409,600
1,100	819,200
1,150	1,638,400
1,200	3,276,800
1,250	6,553,600
1,300	13,107,200
1,350	26,214,400
1,400	52,428,800
1,450	104,857,600
1,500	209,715,200
1,550	419,430,400
1,600	838,860,800
1,650	1,677,721,600
1,700	3,355,443,200
1,750	6,710,886,400
1,800	13,421,772,800
1,850	26,843,545,600
1,900	53,687,091,200
1,950	107,374,182,400
2,000	214,748,364,800
2,050	429,496,729,600

TABLE II.

Years of the World.	*Number of Mankind.*
500	200
540	400
580	800
620	1,600
660	3,200
700	6,400
740	12,800
780	25,600
820	51,200
860	102,400
900	204,800
940	409,600
980	819,200
1,020	1,638,400
1,060	3,276,800
1,100	6,553,600
1,140	13,107,200
1,180	26,214,400
1,220	52,428,800
1,260	104,857,600
1,300	209,715,200
1,340	419,430,400
1,380	838,860,800
1,420	1,677,721,600
1,460	3,355,443,200
1,500	6,710,886,400
1,540	13,421,772,800
1,580	26,843,545,600
1,620	53,687,091,200
1,660	107,374,182,400
1,700	214,748,364,800
1,740	429,496,729,600
1,780	858,993,459,200
1,820	1,717,986,918,400
1,860	3,435,973,836,800
1,900	6,871,947,673,600
1,940	13,743,895,347,200
1,980	27,487,790,694,400
2,020	54,975,581,388,800

(13.) ANTEDILUVIANS, VAST PROBABLE NUMBERS OF, AFTER ALL DEDUCTIONS. Againſt this immenſe number of mankind that might in an ordinary way have been born into the world, between the creation and the deluge in 2050 years, it will no doubt be objected, that all ſuch calculations are mere gueſs-work. But in calculations of this nature ſome regular method muſt be obſerved: and though, according to the courſe of nature ſuch an increaſe and multiplication of mankind might have been periodically, eſpecially at the beginning, yet we will not ſuppoſe that all things went on thus regularly, without interruption. We do not know what extraordinary obſtructions might occur, to ſuch a regular increaſe, Though every married pair might by the courſe of nature have had ſuch a number of children as has been mentioned, yet it might poſſibly be in the Old World as it has been ſince the flood, viz. that ſome marriages have produced many children, others few and ſome none at all. Allowing therefore for all ſuch obſtructions and deficiencies, and likewiſe for all caſualities and accidents (to which men might be liable in that world as well as in the preſent,) in as ample a manner as can be deſired, let the former number be reduced to one half, viz. to 27,487,790,694,400. And this we ſhall now ſuppoſe to be the whole number of thoſe who were born into the world before the deluge. But from this ſum is to be ſubtracted the number of thoſe who died before that time. Of the deſcendents of Seth, Enoch was tranſlated at the age of 365, Lamech died juſt before the flood at 753, and Mahalaleel at 895. Adam and the other five patriarchs lived to above 900. Before, the year 900 therefore, we may ſuppoſe there were no deaths except that of Abel, but that all born within that period were alive together. But in the tenth century death began to reign, and Adam and Eve we may preſume were the firſt over whom death had power in a natural way, as their diſobedience was the cauſe of it. The children

alſo

alſo born of them in the firſt hundred years would alſo die in this 10th century, thoſe born in the ſecond hundred would die in the 11th, thoſe born in the third century would die in the 12th, and ſo on. But though we are far from thinking that after the beginning of the 10th century (till which time few or none died,) the deaths would be equal to the births: yet as we have made large conceſſions all along, we ſhall do the ſame in this caſe, and ſuppoſe them upon the whole to have been equal, eſpecially as we cannot ſay how ſoon that violence which was their crying ſin, began to prevail; and therefore ſhall again reduce the ſum laſt mentioned to one half, to allow for the deaths and prevailing violence, and ſuppoſe the total number of mankind alive upon earth at the deluge to have been no more than 13,743,895,347,200; a number vaſtly exceeding that of the preſent inhabitants of the earth! Nothwithſtanding the very large allowances and abatments made to reduce the number of mankind, yet even the laſt reduction to 13 billions, or millions, of millions, &c. ſeems ſo vaſtly great, that it will hardly be thought poſſible, that ſuch a number of men could ever be at one time upon the earth. Now, though we pretend to no certainty in this point, (which made it the more requiſite to allow largely for deaths and deficiencies,) yet the calculation we have given muſt appear highly probable, ſince it is founded on grounds certain and undeniable; for inſtance, it muſt be allowed, 1. That the Antediluvians were come to the age of puberty and marriage at 160 years, as we find a ſon born in 162: 2. That they have children at the age of 500, as Noah had three ſons after that age: 3. That we have allowed a due interval between the births, viz. ſix years: 4. That we have made the period of doubling far too ſhort, when we had before ſhowed that after 100 marriages conſummated, they would treble themſelves in half the time we have taken for their doubling; and, 5. That there might be 200 perſons of mature age for marriage in the year 500, the men at 160, the women younger. Nevertheleſs, as this is the foundation of our calculation, we ſhall now ſhow that there was at leaſt ſuch a number of perſons marriageable at that age of the world. As we now take 160 for the year of maturity and marriage, according to that period; all thoſe married or marriageable in the year 500 muſt have been born in or before the year 340; the males at leaſt, though the females coming ſooner to maturity, might ſome of them be born later or after the year 380. The following table is drawn up on this principle, wherein we proceed no farther than to the produce of Adam's firſt ſeven ſons: taking it for granted, that as many daughters were born ſoon after them, and married to them. And thus ſuppoſing Adam to have had 54 children, and only 14 of them married before the year 340, we have the 100 pairs, reckoned upon in the above calculations, and 3 pairs over, in that year.

TABLE *of the* SMALLEST PROBABLE NUMBER *of* ADAM'S FAMILY, *in the year* 340.

	Year of the world.		*Children.*		*Married pairs.*
1. Adam and Eve, in	340	might have	54	or	27
1. Cain, married in	166	———	28	—	14
3. Abel, married in	172 }	———	8	—	4
ſuppoſed to have been ſlain in	225 }				
4. Adam's 3d ſon, married in .	178	———	26	—	13
5. Adam's 4th ſon, married in .	184	———	25	—	12
6. Adam's 5th ſon, married in .	190	———	24	—	12
7. Adam's 6th ſon, married in .	196	———	22	—	11
8. Adam's 7th ſon, married in .	202	———	20	—	10
			207		103

(14.) ANTEDILUVIANS UNDER-RATED IN THE PRECEDING CALCULATIONS. To the above 103 married pairs, might be added the produce of the remaining 13 pairs, all born before the year 340, and marriageable in the year 500, which would very much increaſe the number of mankind. And thus the reader may perceive that we have been far from building on uncertain foundations, ſince we have omitted 13 pairs more, which we might have taken into the account. And if it be conſidered that the command given to Adam was to increaſe and multiply and repleniſh the earth, no doubt can be made, but that his own and his children's marriages were fruitful in the procreation of children, that the earth might be inhabited. We may add to theſe conſiderations, that in the whole of the above calculations, (§ 12, 13,) Mr Cockburn has gone far below even probability; and leaſt his calculations ſhould be reckoned too high, has taken for granted ſome things without evidence, and ſtated others in oppoſition to fact. Among the former may be ranked his ſuppoſition that Eve and her antediluvian daughters nurſed their children five years, and that this was neceſſary in order, to give them ſtrength of body to laſt for near 1000 years. But by this rule of reaſoning, he might argue, that, for the ſame purpoſe, theſe ladies, *went four or five years with child!* In the preſent age we know, that 9 months geſtation and 9 months nurſing are ſufficient for the health and ſtrength of the child; and alſo, that more than 9 or at moſt 12 months nurſing, often weakens both mother and child, inſtead of ſtrengthening them. It is much more natural, then, to ſuppoſe, that as the Almighty thought proper, in that early age, to prolong human life to ten times its preſent length for the obvious purpoſe of peopling the world, the ſtrength of both mothers and children were proportioned to the time they were to live. Mr Cockburn's ſuppoſition, that the antediluvians were not marriageable till they were about 160 years of age, is equally incredible. If this rule of proportion

proportion, between their longevity and their maturity is to be held good with regard to their bodies, it muſt be held equally good with regard to their minds; and we muſt ſuppoſe, that at 100 years of age and upwards, they were mere *boys* and *girls* in judgment as well as in ſtrength. But the fact, as recorded by Moſes, is, that theſe antediluvian boys begat children much earlier than Mr Cockburn ſeems to have obſerved. For Seth was only 105 years old when he begat Enos, who was only 90 when he begat Cainan, who again begat Mahalaleel at 70; and this laſt as well as Enoch, begat their children ſo early as the 65th year of their ages. And we have not the ſmalleſt evidence, that any one of theſe was the *firſt born*. Inſtead of ſpending a *fifth* or a *ſixth* part, therefore, of the term of the antediluvian life, before they were marriageable, it is evident that, Mahalaleel and Enoch arrived at puberty within the *ſixteenth* part, if not much earlier. Mr Cockburn ſeems to have founded his idea of the late puberty of the patriarchs upon the Septuagint tranſlation; but as the Hebrew, the Samaritan, and Joſephus, all agree in their early puberty, and almoſt exactly as to the ages of the above mentioned patriarchs when they became fathers, (See § 4. Tab. I.) there is every reaſon to believe that the Septuagint is wrong in this particular. Theſe remarks we only offer as a deciſive evidence, that Mr Cockburn's calculations of the numbers of the antediluvians, inſtead of being exaggerated, are really far too low.

ANTEGO. See ANTIGUA.

ANTEJURAMENTUM, [from *ante*, before, and *juramentum*, oath,] or PRÆJURAMENTUM, by our anceſtors alſo called *juramentum calumniæ*; an oath which both the accuſer and accuſed were anciently obliged to make before purgation. The accuſer was to ſwear, that he would proſecute the criminal; and the accuſed was to make oath the very day that he was to undergo the ordeal, &c. that he was innocent of the fact with which he was charged. If the accuſer failed, the accuſed was diſcharged; if the accuſed, he was underſtood to be guilty, and was not to be admitted to purge himſelf by the ordeal.

ANTEJUSTINIANEAN, an appellation ſometimes given to the ancient Roman law, as it ſtood before the time of the emperor Juſtinian. Tribonian has been often condemned for ſuppreſſing the the writings of the Antejuſtinianean lawyers. Schulting, a celebrated profeſſor at Leyden, has a diſſertation on the equity of this cenſure. Fabricius gives a catalogue of theſe ancient lawyers. Schulting has publiſhed a collection of the Antejuſtinianean writers.

ANTELIUS, or ANTHELIUS, [Ἀντήλιος, Gr. *i. e.* againſt the ſun,] in antiquity, an idol placed over the doors of houſes ſuppoſed to have the guardanſhip or protection of them.

(1.) * ANTELOPE. *n. ſ.* [The etymology is uncertain.] A goat with curled or wreathed horns.—

The *Antelope*, and wolf both fierce and fell.
Spenſer.

(2.) ANTELOPE, in zoology. See CAPRA.

ANTELUCAN, [from *ante*, and *lux*, light,] in eccleſiaſtical writers, is applied to things done in the night, or before day.

ANTELUCANI CÆTUS, ANTELUCAN ASSEMBLIES, meetings of the ancient Chriſtians in times of perſecution for religious worſhip.

ANTELUDIA, [from *ante*, and *ludus*, game,] in antiquity, a day of ſhow or parade preceding the circenſes, wherein the preparations made for thoſe ſolemnities were expoſed in great pomp.

ANTEMATUNUM. See ANDOMADUNUM.

* ANTEMERIDIAN. *adj.* [from *ante*, before, and *meridian*, noon.] Before noon.

* ANTEMETICK. *adj.* [ἀντὶ, againſt, and ἔμω, to vomit.] That which has the power of calming the ſtomach; of preventing or ſtopping vomiting.

* ANTEMUNDANE. *adj.* [*ante*, before, and *mundus*, the world.] That which was before the creation of the world.

(1.) ANTEMURALE, [from *ante*, and *murus*, a wall,] in architecture, a kind of outer wall environing the other walls and works of a place, and preventing the too near acceſs of the enemy to them. It is called by Iſidore *promurale*, as being *pro munitione muri*, for the defence of the wall. It is likewiſe denominated *antipectoralis murus*, and *anpits*; and is uſed to denote any work without the rampart of a place; in which ſenſe it amounts to the ſame with outworks.

(2.) ANTEMURALE, in eccleſiaſtical writers, the veſtibule or entrance of the *preſbyterium*, or BEMA.

ANTENATI, in the modern Engliſh hiſtory, the ſubjects of Scotland, born before king James I's acceſſion to the Engliſh crown, and alive after it; thoſe who were born after the acceſſion being denominated *poſtnati*. The antenati were conſidered as aliens in England, whereas the poſtnati claimed the privilege of natural ſubjects.

(1.) ANTENATUS, [from *ante*, and *natus*, born] is uſed for a ſon, the iſſue of a former marriage.

(2.) ANTENATUS is uſed in law writers for the firſt born, anſwering to what the French call *aîné*.

ANTENCLEMA, [ἀντεγκλημα,] in oratory, is where the whole defence of the perſon accuſed turns on criminating the accuſer. Such is the defence of Oreſtes, or the oration for Milo, *Occiſus eſt ſed latro. Exſectus ſed raptor.* See RECRIMINATION.

ANTENDEIXIS, in medicine, a ſymptom of diſeaſe, forbidding that to be uſed, which previouſly had been thought quite proper.

ANTENICENE, in eccleſiaſtical writers, denotes a thing or perſon prior to the firſt council of Niece; ſuch as the Antenicene faith, Antenicene creeds, Antenicene fathers, &c.

ANTENNÆ, in the hiſtory of inſects, ſlender bodies with which nature has furniſhed the heads of theſe creatures, being the ſame with what are called horns or feelers. See ENTOMOLOGY.

ANTENOR, a Trojan prince, who, after the deſtruction of Troy came to Italy, expelled the Euganians on the river Po, and built the city of Padua, where his tomb is ſaid to be ſtill viſible.

ANTENORÆA, the ancient name of Padua. See laſt article.

* ANTENUMBER. *n. ſ.* [from *ante* and *number*.] The number that precedes another.—Whatſoever virtue is in numbers, for conducing to con-

ſent of notes, is rather to be aſcribed to the *antenumber*, than to the entire number, ſo that the ſound returneth after ſix, or after twelve. *Bacon.*

ANTENUPTIAL, ſomething that precedes marriage; ſuch as antenuptial promiſes, antenuptial preſents, antenuptial covenants, antenuptial fornication, &c. Neoſtadius has a treatiſe *De Pactis Antenuptialibus.*

ANTEPAGMENTA, in the ancient architecture, the jambs of a door. They are alſo ornaments, or garniſhings, in carved work, of men, animals, &c. made either of wood or ſtone, and ſet on the architrave.

* ANTEPAST. *n. ſ.* [from *ante*, before, and *paſtum*, to feed.] A foretaſte; ſomething taken before the time.—Were we to expect our bliſs only in the ſatiating of our appetites, it might be reaſonable, by frequent *antepaſts*, to excite our guſt for that profuſe perpetual meal. *Decay of Piety.*

ANTEPECTORALIS MURUS. See ANTEMURALE, N° 1.

* ANTEPENULT. *n. ſ.* [*antepenultima*, Lat.] The laſt ſyllable but two, as the ſyllable *te* in *antepenult*; a term of grammar.

ANTEPENULTIMA, or ANTEPENULTIMATE. } See laſt article.

ANTEPILANI, among the ancient Romans, the *haſtati* or *principes* of a legion. They are ſuppoſed to have been thus called, becauſe ranged before the *pilani* or *triarii*.

(1.) * ANTEPILEPTICK. *adj.* [ἀντὶ and ἐπιλαμβάνω.] A medicine againſt convulſions.—That bezoar is antidotal, lapis judaicas diuretical, coral *antepileptical*, we will not deny. *Brown's Vul. Errs.*

(2.) ANTEPILEPTICS, in medicine, are chiefly the roots of pœony, valerian, the flowers of the lime tree, miſſetoe of the oak, opium, muſk, camphor, æther, volatile alkali, and the aromatics in general.

* *To* ANTEPONE. *v. a.* [*antepono*, Lat.] To ſet one thing before another; to prefer one thing to another. *Dict.*

ANTEPOSITION, a grammatical figure, whereby a word, which, by the ordinary rules of ſyntax, ought to follow another, comes before it; as when the verb is put before the nominative, the ſubſtantive before the adjective, &c. This figure was frequent among the Greeks and Latins, whoſe language, by its variety of terminations, admitted of the artificial order, without confounding the ſenſe of the words; but in the Engliſh and moſt modern languages, where the natural order is neceſſarily uſed, it is very ſeldom adopted, except in ſuch expreſſions as, *ſaid I, quoth he*, and the like.

* ANTEPREDICAMENT. *n. ſ.* [*antepredicamentum*, Lat.] Something to be known in the ſtudy of logick, previouſly to the doctrine of the predicament.

(1.) ANTEQUIERA, a handſome town of Spain, anciently called *Singilium*, in Grenada, divided into two parts: 1. The UPPER ANTEQUIERA is ſeated on a hill, and has a caſtle. 2. The LOWER ſtands in a fertile plain, and is watered with a great number of brooks. There is a large quantity of ſalt in the mountain; and five miles from the town, a ſpring famous for the cure of the gravel. The remains of the mines, whence the Romans drew immenſe quantities of gold and ſilver, are ſtill to be ſeen. It is ſituated 26 miles N. of Malaga. Lon. 4. 40. W. Lat. 36. 51. N.

(2.) ANTEQUIERA, a town of America, in New Spain, 75 miles SE. of Guaxaqua.

ANTERIDES, in the ancient architecture, buttreſſes erected to ſupport a wall. They were alſo called *antes*, ſometimes *criſmæ*, and by the Greeks ἐρείσματα. They anſwer to what the modern builders call *counterforts*, *archbutants*; the Italians *barbicane*, and *ſperoni*, or ſpurs.

* ANTERIORITY. *n. ſ.* [from *anterior*] Priority; the ſtate of being before either in time or ſituation.

* ANTERIOUR. *adj.* [*anterior*, Lat.] Going before, either with regard to time or place.—If that be the *anteriour* or upper part, wherein the ſenſes are placed, and that the poſteriour and lower part, which is oppoſite thereunto, there is no inferiour or former part in this animal; for the ſenſes being placed at both extremes, make both ends *anteriour*, which is impoſſible. *Brown.*

ANTEROS, in mythology, one of the two Cupids, who were the chief of the number.—They are placed at the foot of the Venus of Medici; this is repreſented with a heavy and ſullen look, agreeable to the poetical deſcription of him, as the cauſe of love's ceaſing. The other was called Eros.

ANTEROTES, a name given by ſome of the ancient writers on gems to a ſpecies of the amethyſt. Some think they meant by it a ſort of opal; but Pliny expreſsly contradicts this, making the anterotes the fifth kind of amethyſt in value.

* ANTES. *n. ſ.* [Lat.] Pillars of large dimenſions that ſupport the front of a building.

ANTESIGNANI, in the Roman armies, ſoldiers placed before the ſtandards, to defend them, according to Limpſius; but Cæſar and Livy mention the antefignani as the firſt line, or firſt body, of heavy armed troops. The velites, who uſed to ſkirmiſh before the army, were likewiſe called antefignanis

ANTESTATURE, in fortification, a ſmall retrenchment made of paliſadoes, or ſacks of earth, with a view to diſpute with an enemy the remainder of a piece of ground.

ANTESTARI, in Roman antiquity, ſignifies to bear witneſs againſt any one who refuſed to make his appearance in the Roman courts of judicature, on the day appointed, and according to the tenor of his bail. The plaintiff, finding the defendant, after ſuch a breach of his engagement, was allowed to carry him into court by force, having firſt aſked any of the perſons preſent to bear witneſs. The perſon aſked to bear witneſs in this caſe, expreſſed his conſent by turning his right ear, which was inſtantly taken hold of by the plaintiff, and this was to anſwer the end of a ſubpœna. The ear was touched upon this occaſion, ſays Pliny, as being the ſeat of memory, and therefore the ceremony was a ſort of caution to the party to remember his engagement.

* ANTESTOMACH. *n. ſ.* [from *ante*, before, and *ſtomach*.] A cavity which leads into the ſtomach.—In birds there is no maſtication or comminution of the meat in the mouth; but it is immediately ſwallowed into a kind of *antiſtomach*, which I have obſerved in piſcivorous birds. *Ray.*

To ANTEVENE, *v. a.* To prevent; to come before.

ANTEVIRGILIAN HUSBANDRY, an appellation given to Mr Tull's new method of horſe-hoeing huſbandry. See HUSBANDRY.

ANTHALIUM, in ancient botany, a root growing in dry places, and about the bigneſs of the fruit of the medlar; it was dug up for food, and eſteemed very wholeſome.

ANTHELIGN, (from ἀντὶ, and ἥλιος, the ſun, in phyſics, ſignifies a mock or ſpurious ſun, a meteor, not very common, of a luminous appearance, ſomewhat reſembling the ſun, ſeen through clouds, ſometimes 4 or 5 times bigger than the ſolar diſk. In its moſt refulgent ſtate, it is as yellow as the ſun; but the lucid tract ſurrounding it, is of a paler yellow, or whitiſh caſt, interſperſed ſometimes with a few reddiſh or ſubfuſcous ſpots. The moſt generally received opinion relative to the formation of this kind of meteor, attributes the phenomenon to a multitude of minute icy or ſnowy particles ſuſpended in the air, and either refracting or reflecting the ſolar rays in ſuch a manner, as to multiply the image of the ſun. But the theory of anthelia, for want of a proper number of obſervations, ſeems not yet to be brought to ſuch a degree of ſatisfaction, as could be deſired. The inſtances of them are rare, See CORONA, HALO, and PARHELION.

ANTHELIX, or ANTIHELIX, in anatomy, the inward protuberance of the external ear, being a ſemicircle within, and almoſt parallel to the helix. See ANATOMY, § 549.

ANTHELMIA, Indian pink.

* ANTHELMINTICK. *adj.* [ἀντὶ, againſt, and ἕλμινθος, a worm.] That which kills worms.—*Antihelminticks*, or contrary to worms, are things which are known by experience to kill them, as oils, or honey taken upon an empty ſtomach. *Arbuthnot.*

(1.) * ANTHEM. *n. ſ.* [ἀντίφωνον, a hymn ſung in alternate parts, and ſhould therefore be written *antiphon.*] A holy ſong; a ſong performed as part of divine ſervice.—

God Moſes firſt, then David did inſpire,
To compoſe *anthems* for his heavenly quire.
Denham.

—There is no paſſion that is not finely expreſſed in thoſe parts of the inſpired writings, which are proper for divine ſongs and *anthems*. *Addiſon.*

(2.) ANTHEM, [from ἀντὶ, and ὕμνος, a hymn, a church ſong performed in cathedral and other ſervice, by the choriſters, divided for that purpoſe into choruſes, who ſing alternately. The word was originally uſed both for pſalms and hymns, when thus performed. Socrates repreſents St Ignatius as the author of this way of ſinging among the Greeks; and St Ambroſe among the Latins. Theodoret attributes it to Diodorus and Flavian. Amalarus Fortunatus has written expreſſly of the order of anthems, *De antiphonarum ordine.* At preſent, the term is uſed in a ſomewhat narrower ſenſe; being applied to certain paſſages taken out of the pſalms, &c. and often accommodated to the particular ſolemnity in hand. Anthems were firſt introduced into the reformed ſervice of the Engliſh church in the beginning of the reign of queen Elizabeth.

(1.) ANTHEMIS, CAMOMILE: A genus of the polygamia ſuperflua order, belonging to the ſyngeneſia claſs of plants; and in the natural method ranking under the 49th order, compoſitæ diſcoides. The eſſential characters are theſe: The receptaculum is chaffy; there is no pappus; the calyx is hemiſpheric and ſubequal; and the florets of the ray are more than five. Of this genus Linnæus enumerates 17 ſpecies, of which the moſt remarkable are the following:

1. ANTHEMIS ARABICA has a branching empalement. The ſeeds of this ſpecies were brought from Africa, by the late Dr Shaw, and diſtributed to many curious botaniſts in this and other countries of Europe. It grows near two feet high with an upright ſtem, having a ſingle flower at the top, from whoſe empalement there are two or three foot-ſtalks put out horizontally, about two inches long, each having a ſingle flower ſmaller than the firſt, like the childing marigold, or hen-and-chicken daiſy.

2. ANTHEMIS NOBILIS, or common camomile, grows in plenty upon commons, and other waſte land. It is a trailing perennial plant, which puts out roots from the branches, by which it ſpreads and multiplies greatly. Of this kind there is a variety with double leaves. Formerly this plant was uſed for planting of walks; which when mowed and rolled, looked well for ſome time; but as it was ſubject to decay in large patches, the walks became unſightly, and it was therefore diſuſed. This ſpecies is eaſily propagated by ſlips, planted about a foot from each other.

3. ANTHEMIS PYRETHRUM, or pellitory of Spain, is a perennial plant, which grows naturally in Spain and Portugal, from whence the roots are brought to Britain. The branches trail upon the ground, and ſpread a foot or more each way; theſe are garniſhed with fine winged leaves, like thoſe of the common camomile. At the extremity of each branch is produced one large ſingle flower, like camomile, but much larger; the rays of which are of a pure white within, but purple on the outſide. After the flowers are paſt, the receptacle ſwells to a large ſcaly cone, having the ſeeds lodged between its ſcales; but unleſs the ſeaſon is dry, the ſeeds will not come to perfection in this country.

4. ANTHEMIS TINCTORIA, with ſawed winged leaves, is a perennial plant, which flowers from June to November, and makes a very pretty appearance, ſome of the flowers being of a white, others of a ſulphur, and ſome of a bright yellow colour. The 1ſt, 3d, and 4th ſorts may be propagated from ſeeds ſown in the ſpring, and will require no other care than to be kept free from weeds: only, the tinctoria muſt be tranſplanted when come up from the ſeeds into borders near ſhrubs, where they may have room to grow; for they ſpread very wide, and therefore require to be placed three feet diſtant from other plants.

(II.) ANTHEMIS, MEDICINAL USES OF THE. The nobilis and the pyrethrum (ſee N° 2, and 3.) are chiefly uſed in medicine. The firſt have a ſtrong, not ungrateful aromatic ſmell, and a very bitter nauſeous taſte. They are accounted carminative, aperient, emollient, and in ſome meaſure anodyne; and ſtand recommended in flatulent co-

lies, for promoting the uterine purgations, ſpaſmodic pains, and the pains of childbed women: ſometimes they have been employed in intermittent fevers and the nephritis. Theſe flowers are frequently alſo uſed externally in diſcutient and antiſeptic fomentations, and in emollient glyſters. They enter the *decoctum pro enemate* and *decoctum pro fomento* of our pharmacopœias. An eſſential oil was formerly directed to be prepared from them, but it is now omitted. A ſimple watery infuſion of them taken in a tepid ſtate, is at preſent frequently employed to promote the operation of emetics. The root of the pyrethrum is the only part endowed with medical virtue. It has no ſenſible ſmell; its taſte is very hot and acrid, but leſs ſo than that of arum or dracunculus: the juice expreſſed from it has ſcarce any acrimony, nor is the root itſelf ſo pungent when freſh, as after it has been dried. Water, aſſiſted by heat, extracts ſome ſhare of its taſte, rectified ſpirit the whole; neither of them elevate any thing in diſtillation. The principal uſe of the pyrethrum, in the preſent practice, is as a maſticatory, for promoting the ſalival flux, and evacuating viſcid humours from the head, and neighbouring parts; by this means, it often relieves the toothach, pains of the head, and lethargic complaints.

(1.) ANTHEMIUS, emperor of the Weſt, was the grand-ſon of Anthemius, miniſter of Theodoſius the younger. By his marriage with the daughter, of the emperor Marcian, he roſe to the higheſt offices of the ſtate; and in 467, was called to the throne, amidſt the general applauſe of the people. He gave his daughter to Ricimer, who took up arms againſt his father-in-law, carried Rome by ſtorm, and murdered Anthemius, in 472.

(2.) ANTHEMIUS, a famous architect, whom Juſtinian employed in building the church of St Sophia, in Conſtantinople, and other ſtructures. He was likewiſe a good mathematician and experimental philoſopher, and ſo ſucceſsfully imitated an earthquake, that he frightened Zeno out of his houſe. It is ſaid alſo, that he made a burning glaſs.

ANTHERA, among botaniſts, that part of the ſtamen which is fixed on the top of the filamentum, within the corolla; it contains the pollen or fine duſt, which, when mature, it emits for the impregnation of the plant, according to Linnæus. The APEX of Ray, Tournefort and Rivinus: *Capſulæ ſtaminis*, of Malpighi.

ANTHERICUM, SPIDER-WORT: A genus of the monogynia order, belonging to the hexandria claſs of plants; and, in the natural method, ranking under the 10th order, *Coronariæ*. The characters are: There is no calyx: The corolla conſiſts of ſix oblong petals, which are expanding: The ſtamina conſiſt of ſix ſubulated erect filaments; the antheræ are ſmall and furrowed: The piſtillum has a three cornered germen, a ſimple ſtylus, and obtuſe ſtigma: The pericarpium is an ovate trifulcated capſule, with three cells and three valves: The ſeeds are numerous and angular. Of this genus Linnæus reckons 9 ſpecies; but only the three following ſeem to deſerve notice.

1. ANTHERICUM FRUTESCENS, with a ſhrubby ſtalk, was formerly known among the gardeners near London by the name of *onion leaved aloe*. It produces many ligneous branches from the root, each ſupporting a plant with long taper leaves, in ſhape like thoſe of an onion, and full of a yellow pulp very juicy. Theſe plants ſend out roots, which run down and faſten themſelves into the earth, by which they multiply greatly. The flowers are produced on long looſe ſpikes, are yellow, and appear at different times, ſo that the plants are never long deſtitute of flowers. This ſpecies is a native of the Cape of Good Hope, and requires ſhelter in winter, though ſome will live in the open air planted cloſe to a wall.

2. ANTHERICUM LILIAGO: Theſe are perennial plants, which are natives of Spain, Portugal, and other warm countries. They were formerly pretty common in the Engliſh gardens; but the ſevere winter of 1740 killed moſt of their roots. They flower in June and July, and the ſeeds are ripe in September.

3. ANTHERICUM RAMOSUM, with a branching ſtalk. Theſe two laſt ſpecies are propagated by ſeeds, which ſhould be ſown in the autumn, in a warm ſituation, on a bed of light ſandy earth. When the plants come up they muſt be kept clear of weeds during the ſummer; and in autumn, when the leaves decay, they ſhould be carefully taken up and tranſplanted into a bed of light earth, at a foot diſtance from one another. If the winter prove ſevere, they ſhould be covered with ſtraw, peaſe-haulm, or old tan.

ANTHESPHORIA, in antiquity, a Sicilian feſtival inſtituted in honour of Proſerpine. The word is derived from the Greek ἄνθος, flower, and φέρω, I carry; becauſe that goddeſs was forced away by Pluto when ſhe was gathering flowers in the fields. Yet Feſtus does not aſcribe the feaſt to Proſerpine; but ſays it was thus called by reaſon ears of corn were carried on this day to the temples.—Antheſphoria ſeems to be the ſame with the *floriſertum* of the Latins, and anſwers to the harveſt-home among us.

ANTHESTERIA, in antiquity, was a feaſt celebrated by the Athenians in honour of Bacchus. The moſt natural derivation of the word is from the Greek ἄνθος, *flos*, a flower, it being the cuſtom, at this feaſt to offer garlands of flowers to Bacchus. The anthefteria laſted three days, the 11th, 12th, and 13th of the month; each of which had a name, ſuited to the proper office of the day. The firſt day of the feaſt was called πιθοίγια, i. e. opening of the veſſels; becauſe on this day they tapped the veſſels, and taſted the wine. The ſecond day they called χόες, *congii*, the name of a meaſure containing the weight of 10 pounds; on this day they drank the wine prepared the day before. The third day they called χύτροι, kettles: on this day they boiled all ſorts of pulſe in kettles: which however they were not allowed to taſte, as being offered to Mercury.

ANTHESTERION, in ancient chronology, the ſixth month of the Athenian year. It contained 29 days; and anſwered to the latter part of our November and beginning of December. The Macedonians called it *dæſius* or *deſius*. It had its name from the feſtival anthereſteria kept in it.

ANTHIA, in zoology, a name by which ſome improperly call the faix Venetorum, or ſcale-fiſh, a long anguilliform fiſh of the *tænia* kind.

ANTHIAS,

ANTHIAS, in zoology, the name of a fiſh ſeeming to approach to the *turdus* or wraſſe kind, of which Rondeletius and ſome other authors have deſcribed four ſpecies. Linnæus makes it a ſpecies of the *labrus*.

ANTHINE, or ANTHINOS, among ancient naturaliſts, is an appellation given to certain ſpecies of wine and oil. *Vinum Anthinos.* [ἀνθινος,] was that prepared with certain fragrant flowers to give it the more agreeable odour.

ANTHINUM OLEUM is alſo denominated *liliatrum*, ſometimes *ſiſſinum*. See laſt article.

ANTHISTIRIA, in botany: A genus of the trigynia order, belonging to the triandria claſs of plants; and, in the natural method, ranking under the 4th order, *Gramina*. The characters are: The calyx is a four-valved glume equally cleft to the baſe: The corolla is a two-valved glume: The ſtamina conſiſt of three ſhort ſlender filaments; the anthera oblong and erect: The piſtillum has an oblong germen; the ſtyli are two; and the ſtigmata are clavated and hairy: There is no pericarpium, except a cloſed calyx: The ſeed is oblong and furrowed. There is only one ſpecies of this graſs. the ciliata or fringed anthiſtiria, a native of India.

ANTHOCEROS, or HORN-FLOWER: A genus the order of algæ, belonging to the cryptogamia claſs of plants; and, in the natural method, ranking under the 57th order, *Algæ*. The eſſential characters are: The calyx of the male is ſeſſile, cylindric, and entire; the antheræ (one) is ſubulated, very long, and two-valved: The calyx of the female is monophyllous, divided into ſix parts, and expanding: The ſeeds are about three, naked and roundiſh.—There are only three ſpecies of the anthoceros, viz.

1. ANTHOCEROS LEVIS, a native of Europe and America.

2. ANTHOCEROS MULTIFIDUS, a native of Germany, found in moiſt ſhady places, and on heaths.

3. ANTHOCEROS PUNCTATUS, or ſpotted anthoceros, a native of Britain.

ANTHOLOGIA, in literature, a collection of Greek epigrams, ſo entitled.

ANTHOLOGION, the ſervice book uſed in the Greek church. It is divided into 12 months, containing the offices ſung throughout the year, of the feſtivals of our Saviour, the Virgin, and other remarkable ſaints.

* ANTHOLOGY. *n. ſ.* [ἀνθολογια, from ἀνθος, a flower, and λεγω, to gather.] 1. A collection of flowers. 2. A collection of devotions in the Greek church. 3. A collection of poems.

ANTHOLYZA, MAD-FLOWER: A genus of the monogynia order, belonging to the triandria claſs of plants; and in the natural method ranking under the 6th order, *Enſatæ*. The eſſential characters are theſe: The calyx is tubular, irregular, and bent back; and the capſule is beneath the flower.

1. ANTHOLYZA RINGENS, whoſe flower-ſtips ſpread aſunder. This hath red, round, bulbous roots, from which ariſe ſeveral rough furrowed leaves, near a foot long, and half an inch broad: between theſe comes out the flower-ſtalk immediately from the root, which riſes two feet high, is hairy, and hath ſeveral red flowers coming out on each ſide. Theſe appear in June, and the ſeeds ripen in September.

2. ANTHOLYZA SPICATA, with narrow furrowed leaves, is in ſhape and ſize like the vernal crocus, but the outer ſkin is thin and white; from this ariſe five or ſix long narrow leaves, which are deeply furrowed. Between theſe ariſe the flower-ſtem, which is a foot and an half high, bending on one ſide towards the top, where the flowers come out on one ſide, ſtanding erect. They are of a white colour, appear in May, and the ſeeds ripen in Auguſt. Both theſe ſpecies are natives of Africa, from whence their ſeeds were firſt obtained, and raiſed in the Dutch gardens. The antholyza may be propagated by off-ſets, which it ſends off in pretty great plenty; or by ſeeds, which are ſometimes perfected in Europe. Theſe ſhould be ſown ſoon after they are ripe, in pots of light earth; which, if plunged in old beds of tan which has loſt its heat, and ſhaded in the middle of the day in hot weather, they will come up the following winter: therefore they muſt be kept covered with glaſſes to ſcreen them from cold, otherwiſe the young plants will be deſtroyed. They may remain in the pots two years, if the plants are not too cloſe, when they will have acquired ſtrength enough to bear tranſplanting; the proper time for which is in July and Auguſt, when their leaves are decayed. In ſummer the pots may be placed in the open air, but in winter they muſt be placed under a hot-bed frame; or in the green houſe, where they are a great ornament when in flower.

ANTHOMANIA, an extravagant fondneſs for curious flowers. A remarkable inſtance of this, occurred in Holland in the 17th century, which ruined many individuals, and was obliged to be put a ſtop to, by the magiſtrates.

ANTHONIANS, a ſet of hermits inſtituted by ST ANTHONY. See N° 3 and 4.

(1.) ANTHONY, king of Navarre, the father of Henry IV. of France. See NAVARRE.

(2.) ANTHONY, Francis, a famous empiric, was born at London, in 1550, and educated at Cambridge, where he ſtudied chemiſtry. He made a great fortune in London, by the ſale of a noſtrum, called the *Aurum Potabile*, concerning which he wrote a treatiſe; printed at Hamburgh in 1598.—His ſon John ſucceeded him, in the ſale of his medicine, by which he had a handſome income. He wrote *Lucas Redivius*, or the Goſpel Phyſician, 1656, 4to. He died in 1665, aged 70, and was buried, with his father, in the church of St Bartholomew the Great, London.

(3.) ANTHONY, ST, was born in Egypt in 251, and inherited a large fortune, which he diſtributed among his neighbours and the poor, retired into ſolitude, founded a religious order, built many monaſteries, and died *anno* 356. Many ridiculous ſtories are told of his conflicts with the devil and of his miracles. There are ſeven epiſtles extant attributed to him. St Anthony is ſometimes repreſented with a fire by his ſide, ſignifying that he relieves perſons from the inflammation called after his name; but always accompanied by a hog, on account of his having been a ſwine-herd, and curing all diſorders in that animal. To do him the greater honour, the Romaniſts in ſeveral places

keep

keep at common charges a hog denominated *St Anthony's hog*, for which they have great veneration. Some will have St Anthony's picture on the walls of their houſes, hoping by that to be preſerved from the plague; and the Italians, who do not know the true ſignification of the fire painted at the ſide of their ſaint, concluding that he preſerves houſes from being burnt, invoke him on ſuch occaſions. Both painters and poets have made very free with this ſaint and his followers; the former, by the many ludicrous pictures of his temptation; and the latter, by divers epigrams on his diſciples or friars; one of which is the following, printed in Stephens's World of Wonders:

Once fedd'ſt thou, Anthony, an herd of ſwine,
And now a herd of monks thou feedeſt ſtill.
For wit and gut alike both charges bin;
Both loven filth alike; both like to fill
Their greedy paunch alike; nor was that kind
More beaſtly, ſottiſh, ſwiniſh, than this laſt.
All elſe agrees: one fault I only find,
Thou feedeſt not thy monks with oaken maſt.

(4.) ANTHONY, ST, gives the denomination to an order of religious founded in France about the year 1095, to take care of thoſe afflicted with St Anthony's fire: (ſee that article, § 7.) It is ſaid, that, in ſome places, theſe monks aſſume to themſelves a power of giving, as well as removing, the *ignis ſacer*, or eryſipelas; a power which ſtands them in great ſtead for keeping the poor people in ſubjection, and extorting alms. To avoid the menaces of theſe monks, the country people preſented them every year with a fat hog a-piece.

(5.) ANTHONY, ST, KNIGHTS OF, a military order, inſtituted by Albert Duke of Bavaria, Holland, and Zealand, when he deſigned to make war againſt the Turks in 1382. The knights wore a collar of gold made in form of a hermit's girdle, from which hung a ſtick cut like a crutch, with a little bell, as they are repreſented in St Anthony's pictures.

(6.) * ANTHONY'S FIRE. *n. ſ.* A kind of eryſipelas.

(7.) ANTHONY'S FIRE, ST, ORIGIN OF THE NAME OF. The eryſipelas got this denomination, as thoſe afflicted with it made their peculiar application to St Anthony of Padua for a cure. It is known, that anciently particular diſeaſes had their peculiar ſaints: thus, in the ophthalmia, perſons had recourſe to St Lucia; in the tooth-ach, to St Apollonia; in the hydrophobia, to St Hubert, &c.

ANTHOPHYLLI, or ANTOPHALI, a denomination given to the larger ſpecies of cloves.

ANTHORA, in botany, the trivial name of a ſpecies of Aconitum. See ACONITUM.

ANTHORISMUS, in rhetoric, denotes a contrary deſcription or definition of a thing from that given by the adverſe party.—Thus, if the plaintiff urge, that to take any thing away from another without his knowledge or conſent, is a theft; this is called ὅρος, or definition. If the defendant reply, that to take a thing away from another without his knowledge or conſent, provided it be done with deſign to return it to him again, is not theft; this is ἀνθορισμός.

(1.) ANTHOS, [a flower, Gr.] by way of excellency appropriated to roſemary, ſo as to expreſs only that plant.

(2.) ANTHOS, in chemiſtry, the quinteſſence or elixer of gold; or a medicine extracted from pearls.

(3.) ANTHOS PHILOSOPHORUM, a method of tranſmuting metals by means of vitriol.

ANTHOSMIAS, among ancient naturaliſts, a rich odoriferous kind of wine. It differs from *anthinos*, as the latter imports a medicated wine ſcented with odoriferous herbs, whereas anthoſmias derived its fragrancy from the native grapes.

ANTHOSPERMUM, the AMBER TREE: A genus of the dioecia order, belonging to the polygamia claſs of plants, and in the natural method ranking under the 47th order, *Stellatæ*. The eſſential characters are: The calyx of the hermaphrodite flower is divided into four parts; there is no corolla; the ſtamina are four, and the piſtilli two; the germen is beneath the flower. Male and female on the ſame or ſeparate plants. Of this genus Linnæus mentions 3 ſpecies: viz.

1. ANTHOSPERMUM ÆTHIOPICA,
2. ANTHOSPERMUM CILIARE, and
3. ANTHOSPERMUM HERBACEA.

} The firſt is moſt generally known in the gardens of the curious. Its beauty conſiſts in its ſmall evergreen leaves, which grow as cloſe as heath. Theſe being bruiſed between the fingers, emit a very fragrant odour; whence the name amber-tree. This plant is eaſily propagated by cuttings during any of the ſummer-months, in a border of light earth; where they will take root in ſix weeks time, provided they are watered or ſhaded as the ſeaſon may require; or if they are planted in pots plunged in a moderate hot-bed, they will take root the ſooner, and there will be a greater certainty in their growing. They muſt be frequently renewed by cuttings, as the old plants are very ſubject to decay, and ſeldom laſt above three or four years.

ANTHOXANTHUM, or VERNAL-GRASS: A genus of the digynia order, belonging to the diandria claſs of plants; and in the natural method ranking under the 4th order, *Gramina*. The eſſential characters are: The calyx is a bivalved gluma, with one flower; the corolla is bivalved, obtuſe, and without any awn. There are three ſpecies; viz.

1. ANTHOXANTHUM INDICUM, a native of India.

2. ANTHOXANTHUM ODORATUM, or ſpring-graſs, a native of Britain: It is one of the earlieſt ſpring graſſes, and is extremely common in our fertile paſtures. The delightful ſmell of new-mown hay is chiefly from this plant. Cows, horſes, ſheep, and goats eat it.

3. ANTHOXANTHUM PANICULATUM, a native of the ſouthern parts of Europe.

ANTHRACIS, ANTHRACIAS, or ANTHRACITIS, names promiſcuouſly uſed by ancient naturaliſts for very different foſſils; viz. the carbuncle, hæmatites, and a kind of aſteria. See CARBUNCLE.

ANTHROCOSIS, in medicine, a corroſive ſcaly ulcer, either in the bulb of the eye or the eye-lids.

(1.) * ANTHRAX. *n. ſ.* [ἄνθραξ, a burning coal.] A ſcab or blotch that is made by a corroſive humour, which burns the ſkin, and occaſions ſharp prickling paine, a carbuncle. *Quincy.*

(2.) ANTHRAX,

(2.) ANTHRAX, in medicine, is the ſame with what is otherwiſe denominated *carbo* and *carbunculus*. Some make a diſtinction between the anthrax and carbuncle, limiting the latter to the glandular parts, and the former to all the others. But the diſtinction is ſcarce worth making. Rivettus, Toſius, Gemma, Meurerus, have wrote on the anthrax. The word is ſometimes alſo uſed for lithanthrax or pitcoal. See LITHANTHRAX.

ANTHROMETRICA MACHINA. See ANTHROPOMETRICA.

ANTHROPODÆMÒN, in ancient writers, a demon concealed under the figure or appearance of a man.

ANTHROPOGLOTTUS, among zoologiſts, an appellation given to ſuch animals as have tongues reſembling that of mankind, particularly to the parrot kind.

ANTHROPOGRAPHY, denotes the deſcription of the human body, its parts, ſtructure, &c. See ANATOMY.

ANTHROPOLATRÆ, in church hiſtory, an appellation given to the Neſtorians, on account of their worſhipping Chriſt, notwithſtanding that they believed him to be a mere man.

ANTHROPOLATRIA, the paying divine honours to a man; ſuppoſed to be the moſt ancient kind of idolatry.

ANTHROPOLITES, a term denoting petrifactions of the human body, as thoſe of quadrupeds are called *zoolites*. It has been doubted whether any real human petrifactions ever occur, and whether thoſe which have been ſuppoſed ſuch were not mere *luſus naturæ*. But the generality of naturaliſts beſt verſed in this branch aſſure us of real anthropolites being ſometimes found. And indeed, as it is univerſally admitted that the zoolites are frequently ſeen, what negative argument therefore can be brought againſt the exiſtence of the others? are not the component parts of the human body nearly ſimilar to thoſe of the brute creation? Conſequently, correſpondent matter may be ſubject to, and acquire, the like accidental changes, wherever the ſame power or cauſes concur to act upon either object. If the former are not ſo common, it may be accounted for, in ſome meaſure, by reflecting that human bodies are generally depoſited in ſelect and appropriated places; whereas the bones of animals are diſperſed every where, and falling into various parts of earth, at greater or leſs depth, there is more probability of their encountering the petrifying agent. Could we credit ſome authors who have treated on this ſubject, they will tell us of entire bodies and ſkeletons that were found petrified. One in particular, diſcovered at Aix en Provence *anno* 1583, in a rocky cliff, the cerebrum whereof, when ſtruck againſt a piece of ſteel, produced ſparks, the bones being at the ſame time friable. The reports of Happel and Kircher are too abſurd for belief. Van Helmont's ſtrange relations, together with thoſe of Jean a Coſta, muſt alſo be rejected as fabulous. Scheuhzer has publiſhed an engraved figure, which he calls the *Antediluvian man*; how far it is authentic, it would be raſh to ſay. It is, however, aſſerted by many reſpectable writers on natural hiſtory, that whole ſkeletons petrified have been brought to light from certain old mines, which remained cloſed up and diſuſed for ſeveral centuries. Theſe indeed are acknowledged to be very rare. Yet it is a known fact, that detached parts, oſteolithi, are ſometimes found, eſpecially in ſituations where either the water, the ſoil, or both, have been obſerved to poſſeſs a ſtrong putreſcent quality. The human vertebræ, fragments or portions of the tibia, and even the whole cranium itſelf, have been ſeen in an abſolute ſtate of petrification. Some of theſe are ſaid to appear vitriolated or mineralized. As to the petrified bones of pretended giants, they are more properly real zoolites, the bones of the larger animals. All theſe bones are found in various ſtates, and under different appearances. Some are only indurated; others calcined, vitriolated, or mineralized; ſome again, are ſimply incruſted; whilſt others have been proved completely petrified. Notwithſtanding what is here advanced, it may be granted that a poſitive *luſus naturæ*, in ſome hands, is repeatedly miſtaken for a real petrification. They are, however, diſtinguiſhable at all times by an experienced naturaliſt; particularly by the two following rules: Firſt, We may determine that foſſil a *luſus naturæ* which, on a ſtrict examination, is obſerved to deviate in any material degree from the true *res analogica exiſtens*. Secondly, By the ſame parity of reaſoning, thoſe foſſil ſhells are to be eſteemed certain petrifications, and genuine Antediluvian *reliquiæ* in which, on a compariſon with their *analogues* collected from the ſea, there appears an exact conformity in ſize and figure.—This comparative obſervation will hold good for all foſſils; that is ſuch as preſent themſelves either under the animal or vegetable form. It is nevertheleſs worthy of notice, that all teſtaceous foſſils are not petrified; ſince ſome kinds of them have been found in beds of ſand, which retained their original perfect ſhape and quality, but at the ſame time they proved very brittle, indeed ſcarcely bearing the moſt gentle touch. Shells of this diſcription are always diſſoluble by acids, in contradiſtinction to the petrified or calcareous foſſil ſhells whoſe property is to reſiſt the action of ſuch like *menſtrua*. See PETRIFACTION.

(1.)* ANTHROPOLOGY. *n. ſ.* [from ἄνθρωπος, man, and λόγος, to diſcourſe.] The doctrine of anatomy; the doctrine of the form and ſtructure of the body of man.

(2.) ANTHROPOLOGY alſo includes the conſideration of the human ſoul, with the laws and effects of its union with the body, as ſenſation, motion, &c. It is particularly uſed, in theology, for a way of ſpeaking of God after the manner of men; by attributing human parts and paſſions to him; as eyes, hands, ears, anger, joy, &c.—We have frequent inſtances of anthropology in holy ſcripture; by which we are only to underſtand the effect, or the thing which God does, as if he had hands, &c.

ANTHROPOMANCY, [from ἄνθρωπος, a man, and μαντία, divination,] a ſpecies of divination, performed by inſpecting the entrails of a human creature.

ANTHROPOMETRIA, a deſcription of the human body, with its ſeveral parts and members according

according to the 3 dimenſions, length, breadth, and thickneſs both conſidered in themſelves, and comparatively to each other.

ANTHROPOMETRICA MACHINA, a name which Sanctorius gave to his weighing chair, contrived for meaſuring the quantity of inſenſible perſpiration.

ANTHROPOMORPHA, a term formerly given to that claſs of animals which have the greateſt reſemblance to the human kind.

ANTHROPOMORPHISM, among eccleſiaſtical writers, denotes the hereſy or error of the Anthropomorphites. See next article.

(1.)* ANTHROPOMORPHITE. *n. ſ.* [ἀνθρωπομορφίτης.] One who believes a human form in the Deity.—Chriſtians as well as Turks have had whole ſects contending that the Deity was corporeal and of human ſhape, though few profeſs themſelves *anthropomorphites*, yet we may find many amongſt the ignorant of that opinion. *Locke.*

(2.) ANTHROPOMORPHITES, in church hiſtory, a ſect of ancient heretics, who taking every thing ſpoken of God in ſcripture in a literal ſenſe, particularly that paſſage of Geneſis in which it is ſaid *God made man after his own image*, maintained that God had a human ſhape. They are likewiſe called *Audeni*, from Audens their leader.

ANTHROPOMORPHITICAL. *adj.* belonging to Anthropomorphites.

ANTHROPOMORPHOUS, ſomething that bears the figure or reſemblance of a man. Naturaliſts give inſtances of anthropomorphous plants, anthropomorphous minerals, &c. Theſe generally come under the claſs of what they call *luſus naturæ*, or monſters. Anthropomorphous ſtones make a ſpecies of figured ſtones. The word is applied to the mandrake.

(1.)* ANTHROPOPATHY. *n ſ.* [ἄνθρωπος, man, and πάθος, paſſion.] The ſenſibility of man; the paſſions of man.

(2.) ANTHROPOPATHY, in theology, a figure, expreſſion, or diſcourſe, whereby ſome paſſion is attributed to God, which properly belongs only to man. Anthropopathy is often uſed promiſcuouſly with anthropology; yet, ſtrictly they ought to be diſtinguiſhed, as the genus from the ſpecies. —Anthropology may be underſtood of any thing human attributed to God; but anthropopathy, only of human affections, paſſions, ſenſations, &c.

(1.)* ANTHROPOPHAGI. *n. ſ.* [*It has no ſingular*, ἄνθρωπος, man, and φάγω, to eat.] Man-eaters; cannibals; thoſe that live upon human fleſh.

The cannibals that each other eat,
The *anthropophagi*, and men whoſe heads
Do grow beneath their ſhoulders. *Shakeſp. Oth.*

(2.) ANTHROPOPHAGI, ANCIENT ACCOUNTS OF. That there have been, in almoſt all ages of the world, nations who have followed this barbarous, practice we have abundance of teſtimonies. The Cyclops, the Leſtrygons, and Scylla, are all repreſented in Homer as *anthropophagi*, or man-eaters; and the female phantoms, Circe and the Syrens, firſt bewitched with a ſhew of pleaſure, and then deſtroyed. This, like the other parts of Homer's poetry, had a foundation in the manners of the times preceding his own. According to Herodotus, among the Euſedonian Scythians, when a man's father died, the neighbours brought ſeveral beaſts, which they killed, mixed up their fleſh with that of the deceaſed, and made a feaſt. Among the Maſſagetæ, when any perſon grew old, they killed him and eat his fleſh; but if he died of ſickneſs, they buried him, eſteeming him unhappy. The ſame author alſo aſſures us, that ſeveral nations in the Indies killed all their old people and their ſick, to feed on their fleſh: he adds, that perſons in health were ſometimes accuſed of being ſick, to afford a pretence for devouring them. According to Sextus Empiricus the firſt laws that were made, were for the prevention of this barbarous practice, which the Greek writers repreſent as univerſal before the time of Orpheus. The philoſophers Diogenes, Chryſippus, and Zeno, followed by the whole ſect of Stoics, affirmed, that there was nothing unnatural in the eating of human fleſh; and that it was very reaſonable to uſe dead bodies for food, rather than to give them a prey to worms and putrefaction. In order to make the trial, however, whether there was any real repugnancy in nature to the feeding of an animal with the fleſh of its own ſpecies, Leonardus Floroventius fed a hog with hog's fleſh, and a dog with dog's fleſh; upon which he found the briſtles of the hog to fall off and the dog to become full of ulcers.

(3.) ANTHROPOPHAGI, MODERN INSTANCES OF. Of the practice of anthropophagy in later times, we have the teſtimonies of all the Romiſh miſſionaries who have viſited the internal parts of Africa, and even ſome parts of Aſia. Herrera ſpeaks of great markets in China, furniſhed wholly with human fleſh, for the better ſort of people. Marcus Paulus ſpeaks of the like in his time, in the kingdom of Concha towards Quinſay, and the iſland of Zapengit; others, of the Java; Barboſa, of the kingdom of Siam and the iſland of Sumatra; others, of the iſlands in the Gulf of Bengal, of the country of the Samogitians, &c. When America was diſcovered, this practice was found to be almoſt univerſal, inſomuch that ſeveral authors have ſuppoſed it to be occaſioned through a want of other food, or through the indolence of the people to ſeek for it; though others aſcribe its origin to a ſpirit of revenge. It appears pretty certain from Dr Hawkeſworth's Account of the Voyages to the South Seas, that the inhabitants of the iſland of New Zealand, a country unfurniſhed with the neceſſaries of life, eat the bodies of their enemies. It appears alſo to be very probable, that both the wars and anthropophagy of theſe ſavages take their riſe and owe their continuance to irreſiſtible neceſſity, and the dreadful alternative of deſtroying each other by violence or of periſhing by hunger. Mr Maſden alſo informs us that this horrible cuſtom is practiſed by the Battas, a people in the iſland of Sumatra. "They do not eat human fleſh (ſays he) as a means of ſatisfying the cravings of nature, owing to a deficiency of other food; nor is it ſought after as a glutinous delicacy, as it would ſeem among the New Zealanders. The Battas eat it as a ſpecies of ceremony; as a mode of ſhowing the detestation of crimes, by an ignominious puniſhment; and as a horrid indication of revenge and inſult to their unfortunate enemies. The objects of this barbarous repaſt are the priſoners taken in war.

war, and offenders convicted and condemned for capital crimes. Persons of the former description may be ransomed or exchanged, for which they often wait a considerable time; and the latter suffer only when their friends cannot redeem them by the customary fine of 20 beenchangs, or 80 dollars. These are tried by the people of the tribe where the fact was committed, but cannot be executed till their own particular raja or chief has been acquainted with the sentence; who, when he acknowledges the justice of the intended punishment, sends a cloth to cover the delinquent's head, together with a large dish of salt and lemons. The unhappy object, whether prisoner of war or malefactor, is then tied to a stake: the people assembled throw their lances at him from a certain distance; and when mortally wounded, they run upon him, as if in a transport of passion; cut pieces from the body with their knives; dip them in the dish of salt and lemon juice; slightly broil them over a fire prepared for the purpose; and swallow the morsels with a degree of savage enthusiasm. Sometimes, according to the degree of their animosity and resentment, the whole is devoured; and instances have been known, where, with barbarity still aggravated, they tear the flesh from the carcase with their mouths. To such a depth of depravity may man be plunged, when neither religion nor philosophy enlightens his steps! All that can be said in extenuation of the horror of this diabolical ceremony is, that no view appears to be entertained of torturing the sufferers; of encreasing or lengthening out the pangs of death; the whole fury is directed against the corse; warm indeed with the remains of life, but past the sensation of pain. I have found a difference of opinion in regard to their eating the bones of their enemies slain in battle. Some persons long resident there, and acquainted with their proceedings, assert that it is not customary; but as one or two particular instances have been given by other people, it is just to conclude, that it sometimes takes place, though not generally. It was supposed to be with this intent that raja Neabin maintained a long conflict for the body of Mr Nairne, a most respectable gentleman and valuable servant of the India Company, who fell in an attack upon the campong of that chief, in the year 1775." It may be said, that whether the dead body of an enemy be eaten or buried, is a matter perfectly indifferent. But whatever the practice of eating human flesh may be in itself, it certainly is relatively, and in its consequences, most pernicious. It manifestly tends to eradicate a principle, which is the chief security of human life, and more frequently restrains the hand of the murderer, than the sense of duty or the dread of punishment. If even this horrid practice originates from hunger, still it must be perpetuated from revenge. Death must lose much of its horror among those who are accustomed to eat the dead; and where there is little horror at the sight of death, there must be less repugnance to murder. See some further observations on this subject, equally just and ingenious, by Dr Hawkesworth, Vol. II. p. 389. and Vol. III. p. 447. &c.

ANTHROPOPHAGIA, the act or habit of eating human flesh. This is pretended by some to be the effect of a disease, which leads people affected with it to eat every thing alike. Some choose only to consider it as a species of PICA. The annals of Milan furnish an extraordinary instance of anthropophagy. A Milanese woman, named Elizabeth, from a depraved appetite, like what women with child, and those whose menses are obstructed, frequently experience, had an invincible inclination to human flesh, of which she made provision by enticing children into her house, where she killed and salted them; a discovery of which having been made, she was broken on the wheel and burnt in 1519.

* ANTHROPOPHAGINIAN. *n. s.* A ludicrous word, formed by *Shakespeare* from *anthropophagi* for the sake of a formidable sound.—Go, knock and call; he'll speak like an *anthropophaginian* unto thee: knock, I say. *Shakespeare.*

* ANTHROPOPHAGY. *n. s.* [ἄνθρωπος, a man, and φαγω, to eat.] The quality of eating human flesh, or man eating.—Upon slender foundations was raised the *anthropophagy* of Diomedes his horses. *Brown's Vulgar Errours.*

ANTHROPOSCOPIA, [from ἄνθρωπος, and σκοπεω, I consider,] the art of judging or discovering a man's character, disposition, passions, and inclinations, from the lineaments of his body. In which sense, anthroposcopia seems of somewhat greater extent than physiognomy, or metoposcophy. Otto has published an Anthroposcopia, *sive judicium hominis de homine ex lineamentis externis.*

* ANTHROPOSOPHY. *n. s.* [ἄνθρωπος; man, and σοφια, wisdom.] The knowledge of the nature of man.

ANTHROPOTHYSIA, the inhuman practice of offering human sacrifices. See SACRIFICE.

ANTHUMON, in the ancient materia medica, a name given to the *epithymum*; or dodder, growing upon thyme.

ANTHUPNOTICS. See ANTHYPNOTICS.

(1.) ANTHUS, in ornithology, a synonime of a species of loxia. See LOXIA.

(2.) ANTHUS, in zoology, a name by which Aldrovand and some other authors have called that species of the *Oenanthe*, known in England by the name of the whin-chatt.

ANTHYLLIS, KIDNEY-VETCH, or LADY'S FINGER: A genus of the decandria order, belonging to the diadelphia class of plants; and in the natural method ranking under the 32d order, *Papilionaceæ*. The essential characters are: The calyx is ventricose, and the legumen is roundish and covered. Linnæus enumerates 9 species; of which the following seem to be most worthy of attention.

1. ANTHYLLIS BARBA JOVIS, or silver-bush, has its name from the whiteness of its leaves. This is a shrub which often grows to the height of 10 or 12 feet, dividing into many lateral branches, garnished with winged leaves composed of an equal number of narrow lobes, which are very white and hairy: the flowers are produced at the extremities of the branches, collected into small heads; these are of a bright yellow colour, and appear in June; sometimes they are succeeded by

ſhort woolly pods, containing two or three kidney ſhaped ſeeds: but unleſs the ſeaſon proves warm, they do not ripen in this country.

2. ANTHYLLIS CYTISOIDES, or ſhrubby woundwort, has long been known in the Engliſh gardens. It is a low ſhrub, ſeldom riſing above two feet high, but ſends out many ſlender branches, garniſhed with hoary leaves, which are ſometimes ſingle, but generally have three oval lobes, the middle being longer than the other two: the flowers are yellow, and come out from the ſides of the branches, three or four joined together, having woolly impalements; but theſe are rarely ſucceeded by ſeeds in England. This ſpecies and the barba jovis may be propagated by cuttings planted during any of the ſummer months; obſerving to ſhade and water them till they have taken good root; when they are to be tranſplanted into pots, and muſt always be houſed in winter.

3. ANTHYLLIS MONTANA, or herbaceous wound wort, with winged leaves, grows naturally in the mountains in the ſouth of France, and in Italy. It is garniſhed with winged leaves, which have an equal number of hairy lobes at the extremity of the branches. The flowers are produced in heads, and are of a purple colour and globular form. They appear in June and July, and the ſeeds ripen in October.

4. ANTHYLLIS VULNERARIA, with unequal winged leaves, is a native of Spain and Portugal, as likewiſe of Wales. It is a biennial plant, having ſingle leaves at bottom, which are oval and hairy; but thoſe which grow out of the ſtalks are winged, each being compoſed of two or three pair of lobes terminated by an odd one. The flowers grow collected into heads at the top of the ſtalks, are of a bright ſcarlet colour, and make a pretty appearance. It flowers in June and July, and the ſeeds ripen in October. The two laſt ſpecies require no particular management further than being kept free from weeds.

* ANTHYPNOTICK. *adj.* from ἀντὶ, againſt and ὕπνος, ſleep.] That which has the power of preventing ſleep; that which is efficacious againſt a lethargy.

* ANTHYPOCHONDRIACK. *adj.* [from ἀντὶ, againſt, and ὑποχόνδρια.] Good againſt hypochondriack maladies.

ANTHYPOMOSIA, in ancient writers, an oath taken by a proſecutor or accuſer, declaring that the abſence of the party accuſed is not for any juſt cauſe, and therefore demanding that judgment may no longer be delayed on that account.

(1.) * ANTHYPOPHORA. *n. ſ.* [ἀνθυποφορὰ.] A figure in rhetorick, which ſignifies a contrary illation, or inference, and is when an objection is refuted or diſproved by the oppoſition of a contrary ſentence. *Smith's Rhetorick.*

(2.) ANTHYPOPHORA, ſtands oppoſed to *Lycophora*, *e. g.* If the *lycophora* be, grammar is indeed a little difficult to obtain; the *anthypophora* may be; grammar is indeed a little difficult to attain, but then its uſe is infinite. See HYPOPHORA.

* ANTHYSTERICK. *adj.* [from ἀντὶ, againſt, and ὑστερικὸς.] Good againſt hyſterics.

(1.) ANTI. (ἀντὶ) A particle much uſed in compoſition with words derived from the Greek, and ſignifies *contrary to*; as, *antimonarchical*, oppoſite to monarchy.

(2.) ANTI, in compoſition, is not confined to "words derived from the *Greek*." Dr Johnſon himſelf, notwithſtanding the above reſtricted definition, (§ 1.) gives inſtances of the contrary. See ANTIACID, ANTICONVULSIVE, ANTICOURTIER, ANTIFEBRILE, ANTIPESTILENTIAL, &c. In fact, it is compounded with words in all the modern languages, often at the pleaſure of authors, to ſave circumlocution. See § 3 & 4.

(3.) ANTI, in literary matters, often makes part of the titles of pieces written by way of anſwer to others, whoſe names are uſually annexed to this prepoſition. See the *Anti* of M. Baillet; the *Anti-Baillet* of M. Menage: the *Anti-Menagiana*, &c. This practice among authors is very ancient. Cæſar the dictator wrote two books by way of anſwer to what had been objected to him by Cato, which he called *Anti-Catones*; theſe are mentioned by Juvenal, Cicero, &c. Vives aſſures us, he had ſeen Cæſar's *Anti-Catones* in an ancient library.

(4.) ANTI, in religious and political controverſy, frequently makes part of the diſtinctive title, aſſumed by the parties themſelves in ſuch diſputes, and is as often beſtowed by the one party upon the other by way of contempt; *e. g.* ANTIBURGHERS, ANTIPÆDOBAPTISTS, ANTIREPUBLICANS, ANTIROYALISTS, &c.

* ANTIACID. *adj.* [from ἀντὶ, and *acidus*, ſour.] Contrary to ſourneſs; alkalis.—Oils are *antiacids*, ſo far as they blunt acrimony; but as they are hard of digeſtion, they produce acrimony of another ſort. *Arbuthnot.*

ANTIADES, in anatomy, the glandules, or kernels, more commonly called tonſils, and almonds of the ears.

ANTIADIAPHORISTS, oppoſite to the ADIAPHORISTS, from ἀντὶ, and ἀδιάφορος, indifferent. an appellation given, in the 14th century to the rigid Lutherans, who diſavowed the epiſcopal juriſdiction, and many of the church ceremonies, retained by the moderate LUTHERANS.

ANTIAPHRODITICS. See ANTAPHRODISIACS and ANTAPHRODITICK.

ANTIARTHRITICS. See ANTARTHRITICS.

ANTIASTHMATICS. See ANTASTHMATICS.

ANTIAXIOMATISM, that which is againſt any known axiom. *Bailey.*

ANTIBACCHIUS, in ancient poetry, a foot conſiſting of three ſyllables, the two firſt long, and the laſt one ſhort; ſuch as the word *virtūte*.

ANTIBALLOMENA, medicines which may be ſubſtituted for each other.

ANTIBARBARA, and ANTIBARBARUM, } titles given to ſeveral works levelled againſt the uſe of barbarous terms and phraſes, chiefly in the Latin tongue. Erafmus, Nizolius, and Celarus, have publiſhed *Antibarbara*. Notenius a Lexicon *Anti-barbarum*, conſiſting of obſervations made by the grammarians of later ages in relation to the purity and corruption of Latin words. Sixtus Amama has given an *Antibarbarum Biblicum*, wherein he pretends to have diſcovered ſeveral ſoleciſms of the barbariſms which have got footing of late ages in the Bible. Peter du Moulin alſo the

the title antibarbarous for a book againſt the uſe of an unknown tongue in divine ſervice.

ANTIBARI, a town of European Turkey, ſituated upon a hill, on the coaſt of the Adriatic Sea. It has a harbour at the foot of the hill, but is thinly peopled.

ANTIBES, a ſea port, of France, in the department of Var, with a ſtrong caſtle. The adjacent grounds produce excellent fruit; and the town is ſituated 15 miles from Nice, in the Mediterranean. Lon. 7. 5. E. Lat. 43. 35. N.

ANTIBIBLOS, in civil law, an inſtrument or ſignature whereby the defendant owns he has received the libel, or a copy of it, and notes the day whereon he received it. This is uſually done on the back of the libel.

ANTIBURGHER SECEDERS, a numerous and reſpectable body of diſſenters from the church of Scotland, who differ from the eſtabliſhed church chiefly in matters of church government, and who differ from the Burgher Seceders, with whom they were originally united, chiefly, if not ſolely reſpecting the lawfulneſs of taking the burgeſs oath. For an account of their origin and principles, See SECEDERS.

ANTICACHECTIC. See ANTICHACHETICK, which is the orthography preferred by Dr Johnſon, though we know not for what reaſon, as it is contrary to the original derivation. We would have conſidered the firſt H, as a typographical error, had not the Doctor uniformly continued it, in different editions of his dictionary.

ANTICADMIA, a ſpecies of mineral cadmia, ſometimes alſo called pſeudo cadmia. It takes this denomination, not as being oppoſite in quality to the cadmia, but becauſe it is uſed as a ſubſtitute for it.

ANTICARDIUM, in anatomy, [from ἀντὶ, and καρδία, the heart,] that hollow part under the breaſt, juſt againſt the heart, commonly called the pit of the ſtomach: called alſo *ſcorbiculus cordis*.

ANTICATARRHAL, an epithet given to medicines, preſcribed for catarrhs.

ANTICATEGORIA, in oratory, denotes a recrimination or mutual accuſation; where the two parties charge each other with the ſame crime.—Apollodorus conſiders the anticategoria as two ſeveral cauſes or actions.

ANTICAUSOTICS, among phyſicians, medicines againſt hot fevers.

* ANTICHACHECTICK. *adj.* [from ἀντὶ, againſt, and κακία, a bad habit.] Things adapted to the cure of a bad conſtitution.

* ANTICHAMBER, *n. ſ.* This word is corruptly written for ANTECHAMBER; which ſee.

ANTICHOLICA, [from ἀντὶ, and χολικὸς,] medicines againſt the cholic.

ANTICHORUS, in botany: A genus of the monogynia order, belonging to the octandria claſs; of which the eſſential characters are: The calyx is a four leaved perianthium: The corolla conſiſts of four expanding petals: The pericarpium is a capſule, above, ſubulated, with four cells, and four valves: The ſeeds are very numerous. There is but one ſpecies, &c.

ANTICHORUS DEPRESSUS, a native of Arabia.

ANTICHRESIS, in the civil law, a covenant or convention, whereby a perſon borrowing money of another, engages, or makes over his lands or goods to the creditor, with the uſe and occupation thereof, for the intereſt of the money lent. This covenant was allowed of by the Romans; among whom uſury was prohibited: it was afterwards called mortgage, to diſtinguiſh it from a ſimple engagement, where the fruits of the ground were not alienated, which was called *vif-gage*.

ANTICHRIST, among eccleſiaſtical writers, denotes a great adverſary of Chriſtianity, who is to appear upon the earth, towards the end of the world. There have been demonſtrations, diſputations, and proofs, in great number, both that the pope is, and that he is not Antichriſt. F. Calmet is very full in deſcribing the father and mother of Antichriſt, his tribe and pedigree, his wars and conqueſts, his atchievements againſt Gog, Magog, &c. Some place his capital at Conſtantinople, others at Jeruſalem, others at Moſcow, and ſome at London; but the generality at Rome, though theſe laſt are divided. Grotius and ſome others ſuppoſe Rome Pagan to have been the ſeat of Antichriſt, and Caligula or Nero the perſon: Moſt of the Lutheran and reformed doctors contend earneſtly for Rome Chriſtian, under the papal hierarchy. In fact, the point having been maturely debated at the council of Gap, held in 1603, a reſolution was taken thereupon, to inſert an article in the confeſſion of faith, whereby the pope is formally declared to be Antichriſt.—Pope Clement VIII. was ſtung to the quick with this deciſion; and even king Henry IV. of France was not a little mortified, to be thus declared, as he ſaid, an *imp of Antichriſt*. M. le Clerc holds, that the rebel Jews and their leader Simon, whoſe hiſtory is given by Joſephus, are to be reputed as the true Antichriſt. Lightfoot and Vanderhart rather apply this character to the Jewiſh Sanhedrim. Hippolitus and others held, that the devil, himſelf was the true Antichriſt; that he was to be incarnate, and make his appearance in human ſhape, before the conſummation of all things.—Others, among the ancients, held, that Antichriſt was to be born of a virgin, by ſome prolific power, imparted to her by the devil. A modern French writer, of the female ſex, Madam Bourignon, whom many hold for a ſaint, has improved on this ſentiment; maintaining that Antichriſt is to be begotten by the devil, on the body of a witch, by means of the ſemen of a man, caught in the commiſſion of a certain crime, and conveyed, &c. Father Malvenda, a Jeſuit, hath publiſhed a large work, entitled *Antichriſto*, in which this ſubject is amply diſcuſſed. It conſiſts of thirteen books. In the firſt, he relates all the opinions of the fathers with regard to Antichriſt: In the ſecond, he ſpeaks of the times when he ſhall appear; and ſhows, that all the fathers, who ſuppoſed Antichriſt to be near at hand, judged the world was near its period. In the third, he diſcourſes of his origin and nation; and ſhows that he is to be a Jew, of the tribe of Dan: this he founds on the authority of the fathers; on the paſſage in Geneſis xlix. 17. *Dan ſhall be a ſerpent by the way*, &c.; on that of Jeremy viii. 16. where it is ſaid, *The armies of Dan ſhall devour the earth*; and on Rev. vii. where St John, enumerating all the tribes of Iſrael, makes no mention of

that of Dan. In the fourth and fifth books, he treats of the ſigns of Antichriſt. In the fifth, of his reign and wars. In the ſeventh, of his vices. In the eighth, of his doctrine and miracles. In the ninth, of his perſecutions: and in the reſt, of the Jews, the reign of Jeſus Chriſt, and the death of Antichriſt, after he has reigned three years and an half. See alſo *Lowman on the Revelation*. Hannius and ſome others, to ſecure Antichriſt to the pope, (notwithſtanding that this latter ſeemed excluded, by not being of the tribe of Dan,) have broke in upon the unity of Antichriſt, and aſſert, that there is to be both an eaſtern and a weſtern Antichriſt. How endleſs are conjectures? Some of the Jews, we are told, actually took Cromwell for the Chriſt; while ſome others have laboured to prove him Antichriſt himſelf! Pfaſſius aſſures us, he ſaw a folio book in the Bodleian library, written on purpoſe to demonſtrate this latter poſition. Upon the whole, the Antichriſt mentioned by the apoſtle John, 1 Ep. ii. 18. and more particularly deſcribed in the book of Revelation, ſeems evidently to be the ſame with the *Man of Sin*, &c. characteriſed by St Paul, in his ſecond Epiſtle to the Theſſalonians, chap. ii. And the entire deſcription literally applies to the exceſſes of papal power. Had the right of private judgement, ſays an excellent writer, been always adopted and maintained, Antichriſt could never have been; and when the ſacred right comes to be univerſally aſſerted, and men follow the voice of their own reaſon and conſciences, Antichriſt can be no more.

(1.) * ANTICHRISTIAN. *adj.* [from ἀντὶ, againſt, and χριστιανὸς.] Oppoſite to Chriſtianity, —That deſpiſed, abject, oppreſſed ſort of men, the miniſters, whom the world would make *antichriſtian*, and ſo deprive them of heaven. *South.*

(2.) ANTICHRISTIANS properly denote the followers or worſhippers of Antichriſt. The word is more particularly underſtood of thoſe who ſet up or believe in a falſe Chriſt or Meſſiah.

(1.) * ANTICHRISTIANISM. *n. ſ.* [from *antichriſtian*.] Oppoſition or contrarity to Chriſtianity.—Have we not ſeen many, whoſe opinions have faſtened upon one another the brand of *antichriſtianiſm? Decay of Piety.*

(2.) ANTICHRISTIANISM, a ſtate or quality in perſons or principle, which characterizes them as antichriſtian, or oppoſite to the kingdom of Chriſt. M. Jurieu takes the idea of the unity of the church to have been the ſource of *Antichriſtianiſm*. Had not mankind been infatuated with this, they would never have ſtood in ſuch awe of the anathemas of Rome. It is on this the popes erected their monarchical power.

* ANTICHRISTIANITY. *n. ſ.* [from *antichriſtian*.] Contrariety to Chriſtianity.

* ANTICHRONISM. *n. ſ.* [ἀντὶ, againſt, and χρόνος, time.] Deviation from the right order or account of time.

(1.) ANTICHTHON, from ἀντὶ and χθὼν, earth,] in ancient aſtronomy, a globe of earth reſembling our's, and ſuppoſed to be moving round the ſun, but inviſible to us, becauſe on the oppoſite ſide; that luminary being always exactly interpoſed between this other earth and our's. This idea was aſſerted by Pythagorus and his diſciples, as is teſtified by Ariſtotle, Plutarch, &c. They reaſoned from the ſuppoſed perfection of the number *ten*, and concluded there muſt be juſt ſo many ſpheres; and as our ſenſes only diſcover nine, viz. the ſeven planets, the ſphere of the fixed ſtars, and our earth, they imagined a tenth oppoſite to our's. Some of the fathers, who endeavoured to accommodate the doctrine of the heathen philoſophers to thoſe of Criſtianity, aſſert that this Pythagorean earth is no other than the heavens of the righteous.

(2.) ANTICHTHONES, or ANTIGENÆ, in geography, are thoſe who inhabit countries diametrically oppoſite to each other. In which ſenſe, antichthones amount to much the ſame with what we more uſually call *antipodes*. The word is alſo uſed in ancient writers, to denote the inhabitants of contrary hemiſpheres. See ANTIPODES and ANTOECI.

* *To* ANTICIPATE. *v. a.* [*anticipo*, Latin.] 1. To take ſomething ſooner than another, ſo as to prevent him that comes after; to take firſt poſſeſſion.—God hath taken care to *anticipate* and prevent every man, to draw him early into his church; to give piety the prepoſſeſſion, and ſo engages him in holineſs. *Hammond.* 2. To take up before the time at which any thing might be regularly had.—I find I have *Anticipated* already, and taken up from Boccace, before I come to him; but I am of the temper of kings, who are for preſent money, no matter how they pay it. *Dryden.* 3. To foretaſte, or take an impreſſion of ſomething, which is not yet, as if it really was.—The life of the deſperate equals the anxiety of death, who but act the life of the damned, and *anticipate* the deſolations of hell. *Brown's Vulgar Errours.* 4. To prevent any thing by crouding in before it; to preclude.—I am far from pretending to inſtruct the profeſſion, or *anticipating* their directions to ſuch as are under their government. *Arbuthnot.*

(1.) * ANTICIPATION. *n. ſ.* [from *anticipate*.] 1. The act of taking up ſomething before its time.—The golden number gives the new moon four days too late, by reaſon of the aforeſaid *anticipation*, and our neglect of it *Holder*. 2. Foretaſte.—If we really live under the hope of future happineſs, we ſhall taſte it by way of *anticipation* and forethought, an image of it will meet our minds often, and ſtay there, as all pleaſing expectations do. *Atterbury.* 3. Opinion implanted before the reaſons of that opinion can be known.—The eaſt and weſt, the north and ſouth, have the ſame *anticipation* concerning one ſupreme diſpoſer of things. *Stillingfleet.*

(2.) ANTICIPATION, [from *ante*, before, and *capio*, I take,] in logic, a preſumption, prejudice, or preconceived opinion.

(3.) ANTICIPATION, in medicine, is applied to diſeaſes, wherein ſome of theſe ſymptoms which regularly belong to ſome future period, appear in the beginning.

(4.) ANTICIPATION, in philoſophy, denotes the firſt idea of a thing, without which we can neither name, think, doubt, or even enquire concerning it. It is alſo denominated prenotion, and in this ſenſe, makes the ſecond of Epicurus's criterions of truth.

(5.) ANTICIPATION, in rhetoric, a figure otherwise called *prolepsis*.

(1.) * ANTICK. *adj.* [probably from *antiquus*, ancient, as things out of use appear old.] Odd; ridiculously wild; buffoon in gesticulation.—

What! dares the slave
Come hither cover'd with an *antick* face,
And fleer and scorn at our solemnity? *Shak.*

(2.) * ANTICK. *n. f.* 1. He that plays antics; he that uses odd gesticulation: a buffoon.—

Within the hollow crown,
That rounds the mortal temples of a king,
Keeps death his court; and there the *antick* sits,
Scoffing his state. *Shakespeare.*

2. Odd appearance.—

A work of rich entail, and curious mold,
Woven with *anticks* and wild imagery.
Fairy Queen.

(3.) ANTICK, in sculpture and painting, a fantastical composure of figures of different natures, sexes, &c. as men, beasts, birds, flowers, fishes, and things merely imaginary. It amounts to much the same thing with what the Italians call *grotesco*, and the French *grotesque*.

* To ANTICK. *v. a.* [from *antick*.] To make antick.—

Mine own tongue
Splits what it speaks; the wild disguise hath almost
Antick us all. *Shakespeare.*

* ANTICKLY. *adv.* [from *antick*.] In an antick manner; with odd postures; wild gesticulations, or fanciful appearance.—

Scrambling, out-facing, fashion-mongring boys,
That lye, and cog, and flout, deprave, and slander,
Go *antickly*, and shew an outward hideousness,
And speak of half a dozen dangerous words.
Shakespeare.

ANTICK-WORK. See ANTICK, N° 3.

* ANTICLIMAX. *n. f.* [from ἀντὶ and κλῖμαξ.] A sentence in which the last part expresses something lower than the first.—A certain figure which was unknown to the ancients, is called by some an *anticlimax*. *Addison.*—This distich is frequently mentioned as an example:—

Next comes Dalhousey, the great god of war,
Lieutenant col'nel to the earl of Mar.

ANTICNEMION, [from ἀντὶ, and κνημὴ, the shin bone,] in anatomy, denotes the shin; or the fore prominent part of the tibia.

* ANTICONVULSIVE. *adj.* [from ἀντὶ, against, and *convulsive*.] Good against convulsions.—Whatsoever produces an inflammatory disposition in the blood, produces the asthma, as *anticonvulsive* medicines. *Floyer.*

(1.) * ANTICOR. *n. f.* [from ἀντὶ, against, and *cor*, the heart.] A preternatural swelling of a round figure, occasioned by a sanguine and bilious humour, and appearing in a horse's breast, opposite to his heart.—An *anticor* may kill a horse, unless it be brought to a suppuration by good remedies. *Farrier's Dict.*

(2.) ANTICOR, or ANTICOEUR, among horses, an inflammation in a horse's throat, is the same with the quinzy in mankind. See FARRIERY, xxxvii. 2.

ANTICOSTE, a barren island lying in the mouth of the river St Laurence, in North America. Lon. 64. 16. W. Lat. 50. 30. N.

* ANTICOURTIER. *n. f.* [from ἀντὶ, against, and *courtier*.] One that opposes the court.

ANTICUM, in architecture, a porch before a door; also that part of a temple, which is called the outer temple, and lies between the body of the temple and the portico. It is sometimes called *ante*.

ANTICURBRIDGE, a small town of Ireland, in the county of Antrim.

ANTICUS. See SERRATUS, PERONÆUS, and TIBIALIS.

ANTICYRA, in ancient geography, a town in Phocis, on the Corinthian bay, opposite to Cirrha, lying to the west on the same bay. The Phocians seizing the temple of Apollo at Delphi, a war, called *the sacred*, commenced, and lasted ten years; when Philip, father of Alexander the great, avenged the god by destroying many of the cities of the pillagers. Anticyra was one of the number. It was again taken and subverted by Attilius a Roman general, in the war with the Macedonians. It afterwards became famous for its hellebore. That drug was the root of a plant, the chief produce of the rocky mountains above the city, and of two kinds; the black, which had a purgative quality; and the white, which was an emetic. Sick persons resorted to Anticyra to take the medicine, which was prepared there by a peculiar and very excellent recipe: Hence the adage, *Naviget Anticyram*. By the port in the second century was a temple of Neptune, not large, built with selected stones, and the infide white-washed, the statue of brass. The agora or market-place was adorned with images of the same metal; and above it was a well with a spring, sheltered from the sun by a roof supported by columns. A little higher was a monument formed with such stones as occurred, and designed, it was said, for the son of Iphitus. One of these, Schedius, was killed by Hector, while fighting for the body of Patroclus, but his bones were transported to Anticyra; where his brother died after his return from Troy. About two stadia or a quarter of a mile distant was a high rock, a portion of the mountain, on which a temple of Diana stood, the image bigger than a large woman, and made by Praxiteles. The walls and other edifices at Anticyra were probably erected, like the temple of Neptune, with stones or pebbles. The site is now called *Asprospitia*, or *The White Houses*; and some traces of the buildings from which it was so named remain. The port is land-locked, and frequented by vessels for corn. Some paces up from the sea is a fountain.

ANTIDACTYLUS, [from ἀντὶ, and δακτύλος, dactyle,] a name given by some to the anapæst, which is the reverse of a dactyl, and consists of two short syllables and one long: e. g. *pĕtās*.

ANTIDÆMONICI, [from ἀντὶ, and δαίμων, *demon*,] in ecclesiastical history, a sect who denied the existence of devils, or evil spirits; also all spectres, incantations, witchcrafts, &c.

ANTIDESMA, in botany, a genus of the dioecia order, belonging to the pentandria class of plants. The calyx of the male is five-leav'd; there is no corolla; the antheræ are bifid: The female calyx is five-leaved; the corolla is wanting; the stigmata are five; the berry is cylindric and one-seeded.

There

There is but one ſpecies; viz.

ANTIDESMA ALEXITERIA, a native of India.

ANTIDICOMARIANITES, [from *ἀντίδικος*, adverſary, and *Μαρία*, Mary,] an ancient ſect, eſteemed heretics, who ſaid that the virgin Mary did not preſerve a perpetual virginity, but that ſhe had ſeveral children by Joſeph after our Saviour's birth. Their opinion was grounded on ſome expreſſions of our Saviour, wherein he mentions his brothers and his ſiſters; and of St Matthew, where he ſays, that Joſeph knew not Mary *till* ſhe had brought forth her firſt born ſon. And indeed there ſeems to be nothing inconſiſtent with either ſcripture or reaſon in the opinion. The oppoſite notion requires a degree of faith in Joſeph's *abſtinence*, by no means either *eaſy*, or requiſite to be granted. As we hear of no prohibition after our Saviour's birth, we need not doubt but Joſeph uſed the *jus mariti*, to which his marriage entitled him. But it was neceſſary for thoſe prieſts who made a *goddeſs* of Mary, and who made a pretended *virtue* of breaking the firſt command of God and nature, "increaſe and multiply," to repreſent their female idol as a perpetual immaculate virgin. The Antidicomarianites were the diſciples of Helvidius and Jovinian, who appeared in Rome towards the cloſe of the 4th century.

ANTIDORON, in eccleſiaſtical writers, a name given by the Greeks to the conſecrated bread, out of which the middle part, marked with the croſs, wherein the conſecration reſides, being taken away by the prieſt, the remainder is diſtributed after maſs to the poor. On the ſides of the antidoron are impreſſed the words *Jeſus Chriſtus vicit*. The word is formed from *δωρον*, *donum*, a gift, as being given away *loco muneris*, or in charity. The antidoron is alſo called *panis præſanctificatus*. Some ſuppoſe the antidoron to be diſtributed in lieu of the ſacrament to ſuch as were prevented from attending in perſon at the celebration; and thence derive the origin of the word, the euchariſt being denominated *doron*, gift, by way of eminence.

ANTIDOSIS, [from *ἀντὶ*, and *δίδωμι*, to give,] in antiquity, denotes an exchange of eſtates, practiſed by the Greeks on certain occaſions, with peculiar ceremonies, and firſt inſtituted by Solon. When a perſon was nominated to an office, the expence of which he was not able to ſupport, he had recourſe to the antidoſis; that is, he was to ſeek ſome other citizen of better ſubſtance than himſelf, who was free from this, and other offices; in which caſe, the former was excuſed. In caſe the perſon thus ſubſtituted, denied himſelf to be the richeſt, they were to exchange eſtates, after this manner: the doors of their houſes were cloſe ſhut up and ſealed, that nothing might be conveyed away; then both took an oath to make a faithful diſcovery of all their effects, except what lay in the ſilver mines, which by the laws, was excuſed from all impoſts; accordingly, within three days, a full diſcovery and exchange of eſtates were made.

* ANTIDOTAL. *adj.* [from *antidote*.] That which has the quality of an antidote, or the power of counteracting poiſon.—That bezoar is *antidotal* we ſhall not deny. *Brown.*

ANTIDOTARY is uſed by ſome writers for a diſpenſatory. We have antidotaries of ſeveral authors, as thoſe of Meuſe, Rhaſis, &c.

(1.) * ANTIDOTE. *n. ſ.* [*ἀντίδοτος*, *antidotus*, Lat. a thing given in oppoſition to ſomething elſe.] A medicine given to expel the miſchiefs of another, as of poiſon. *Quincy.*—

Truſt not the phyſician,
His *antidotes* are poiſon, and he ſlays
More than you rob. *Shakeſpeare.*

(2.) ANTIDOTE. The Indian phyſic conſiſts much in the uſe of antidotes. The root mungo, and the viper-ſtone, are held ſovereign antidotes againſt the bite of the *cobras de capello*, and other venomous creatures.

* ANTIDYSENTERICK. *adj.* [from *ἀντὶ*, againſt, and *dyſenteria*, a bloody flux.] Good againſt the bloody flux.

ANTIELMINTHICS. See ANTHELMINTHICK.

ANTIEMETICS. See ANTEMETICK.

ANTIEPILEPTIC ELIXIR. Of all the abſurd noſtrums that have been preſcribed as antiepileptics, we think the following, (which we found in a celebrated Dictionary, under this title) is one of the moſt ridiculous. "The ſpirit of a *human head* mixed with an equal quantity of ſpirit of wine, in which opium has been diſſolved!" We may ſafely ſay, there were little *brains* in the head, that dictated ſuch an anthropophaginian preſcription; elſe the owner might have diſcovered, that the opium and ſpirit of wine would have as much virtue without the diſtilled human head as with it. Or if a ſpirit extracted from an animal ſubſtance was reckoned abſolutely neceſſary, he might have known that the common volatile alkali would anſwer every purpoſe.

* ANTIFEBRILE. *adj.* [from *ἀντὶ*, againſt, and *febris*, a fever.] Good againſt fevers.—*Antifebrile* medicines check the ebullition. *Floyer.*

ANTIGNE, a town of France, in the department of Vienne.

ANTIGNY, a town of France, in the department of Cher.

ANTIGONE, in fabulous hiſtory, the daughter of Oedipus, king of Thebes, who led her father, when blind and baniſhed. She was ſlain by the uſurper Creon, whoſe ſon Hæmon, being in love with her, killed himſelf upon her tomb. Her death was avenged upon Creon by Theſeus.

ANTIGONEA, or ANTIGONIA, in ancient geography, 1. a city of Bithynia, ſo called from Antigonus, the ſon of Philip, and afterwards Nicæa: 2. in Epirus, to the N. of the Montes Ceraunii, oppoſite the city of Oricum: 3. in Arcadia, ſo called in honour of king Antigonus: 4. in Macedonia, in the territory of Mygdonia: 5. in Chalcidice, in Macedonia, on the E. ſide of the Sinus Thermaicus: 6. in Syria, built by Antigonus, not far from Antioch, on the Orontes; but ſoon after deſtroyed by Seleucus, who removed the inhabitants to Seleucia, a town built by him: and 7. one in Troas, called Alexandrea, in Pliny's time.

(1.) ANTIGONUS, king of Aſia, one of the captains of Alexander the Great, was the ſon of Philip, a Macedonian nobleman. Upon the death of Alexander, when a diviſion of the provinces took place, Pamphylia, Lycia, and Phrygia Major fell to his lot; and after the death of Perdic-

cas,

cas, that of Lycaonia was added. He was entrusted with the command of the Macedonian household troops, and when Eumenes was declared a public enemy, he was ordered to prosecute the war against him with the utmost vigour. Eumenes was defeated at the beginning of this war, and forced to retire with 600 brave followers, to an inaccessible castle on a rock; and his friends having assembled a new army for his relief, were also routed by Antigonus, whose ambitious projects began now to be manifest. After Antipater's death, Polysperchon succeeding as tutor to the young king of Macedon, Antigonus aspired at the lordship of all Asia. The power of Eumenes made Antigonus greatly desire his interest, but that faithful commander escaping from the fortress in which he was blockaded, raised an army, and was appointed the royal general in Asia. In conjunction with the governors of Upper Asia, he was successful in several engagements, against Antigonus, but was at last betrayed and put to death; and the governors who had joined him submitted to Antigonus. After this, seizing the treasures at Babylon, Seleucus fled to Ptolemy, with whom, and Lysimachus and Cassander, he entered into a confederacy, for the purpose of curbing the power of Antigonus. But the latter, with his son Demetrius, prevailed, in subduing Syria and Phenicia, in forcing the Nabathæan Arabs, near Judea, to his terms, and in expelling Seleucus from Babylon. Upon which the confederates were obliged to allow him the possession of all Asia, except the Greek cities, which were to continue free. This treaty was soon violated; and Ptolemy made a successful descent in Lower Asia, and on some islands of the Archipelago; but was defeated by Demetrius, who took Cyprus, with many prisoners. On this victory Antigonus assumed the title of king, and bestowed the same on his son; and from this time, A. A. C. 306, his reign in Asia, Ptolemy's in Egypt, and Alexander's other captains in their governments properly commence. He had not long born this title when Cassander, Seleucus, and Lysimachus, again combining against him, defeated the forces under him and his son, at Ipsus; and in this battle he fell, in the 84th year of his age, A. A. C. 301. Antigonus was ardent in his passions, and often used improper means for their gratification; but he was a sagacious, active, brave, and fortunate warrior; and in private concerns strictly just.

(2.) ANTIGONUS, king of Judea, the son of Aristobulus. He entered into an alliance with the king of the Parthians, and besieged Jerusalem. He cut off his uncle Hircanus's ears, to incapacitate him for the high-priesthood; and put Joseph, Herod's brother, to death. At length, Herod took him and sent him to Mark Antony; who, to gratify Herod, cut off his head, and thereby extinguished the Asmonean race, who had reigned 126 years. This happened, A. A. C. 36.

(3.) ANTIGONUS GONATUS, son of Demetrius Poliorcetes, and grandson of Antigonus, king of Asia. He was eminently distinguished by his filial affection, humanity, and mild disposition. At his father's death, which he greatly lamented, he succeeded him in all his European dominions, as well as in the kingdom of Macedon, and other cities in Greece. The Gauls having invaded his country, he defeated and expelled them, but not long after, Pyrrus king of Epirus routed him. Yet when Pyrrus was slain at Argos, and his head brought to Antigonus by his son, he was much displeased, and covering it with his robe, ordered the body to be searched for and honourably interred. His kind treatment of Helenus the son of that unfortunate king who had fallen into his hands, was equally singular. The taking of the city of Corinth by intrigue, was the meanest action of his reign, but by this he maintained the freedom of the small states of Greece, and enlarged his own dominions. By cultivating the arts of peace, he not only secured the affections of his subjects to himself, but to his descendants. His designs were opposed by the Achæans, headed by Aratus, who recovered Corinth; but he pursued his plan, and left his kingdom in peace about the 80th year of his life, and 34th of his reign, A. A. C. 243; and was succeeded by his son Demetrius II.

(4.) ANTIGONUS, the II. surnamed DOSON, king of Macedonia, the son of Antigonus I. succeeded his brother Demetrius II. A. A. C. 225, and was soon after chosen commander in chief of the Achæan forces by sea and land. The league being greatly strengthened by the accession of the Epirotes, Beotians, Phocians, Arcadians, and Thessalians, Cleomenes III. king of Sparta, raised a great army to oppose Antigonus, but being deserted by his allies, the Argives, he was obliged to retreat to defend his own kingdom, after destroying Megalopolis. Antigonus, after taking a number of cities, completely defeated Cleomenes at Selasia, who fled to Egypt after the battle, leaving Lacedæmon open to the victorious army, A. A. C. 221. Antigonus, however, used his victory with great moderation, giving the Spartans a free republican government, and restoring their ancient laws, which their late sovereign had greatly altered. After this the barbarians having attacked Macedonia, Antigonus returned and put them to flight, but did not long enjoy his good fortune: for he died next year, and was succeeded by his nephew Philip VI. A. A. C. 220.

ANTIGRAPHE, [from ἀντὶ and γράφω, I write,] in antiquity, denotes a law-suit about kindred, whereby a person claimed relation to such or such a family.

ANTIGRAPHIA, or ARCHIGRAPHIA, the office of an ANTIGRAPHUS. See No. 3.

(1.) ANTIGRAPHUS, in antiquity, an officer of Athens, who kept a counterpart of the apodecti or chief treasurer's accounts, to prevent mistakes, and keep them from being falsified.

(2.) ANTIGRAPHUS, in ecclesiastical writers, an abbreviator of the papal letters; in which sense the word is used by pope Gregory the Great in his register.

(3.) ANTIGRAPHUS, or ARCHIGRAPHUS, in writers of the middle age, a secretary or chancellor, so called, on account of his writing answers to the letters sent to his master.

(4.) ANTIGRAPHUS, is also used by Isidorus for one of the notes of sentences, marked with a dot, to denote diversity of sense in translations.

ANTIGUA, or ANTEGO, one of the Antilles or Caribbee islands, situated 60 miles E. of St Christopher's,

topher's, and 40 N. of Guadaloupe. It is about 20 miles long and as many broad, and 50 in circumference; and is reckoned the largeſt of all the Britiſh leeward iſlands, containing about 70,000 acres of ground. It is the ſeat of the governor general of theſe iſlands. Antigua having no rivers, and but few ſprings, or ſuch as are brackiſh, the inhabitants are obliged to preſerve the rain water in ciſterns. The air is not ſo wholeſome as in the neighbouring iſlands. Antigua is very ſubject to hurricanes; but has excellent harbours, particularly Engliſh harbour, which is capable of receiving the largeſt men of war in the navy. It has alſo a dock yard ſupplied with ſtores and conveniences for repairing and careening ſhips. The principal trade, however, is carried on in the harbour of St John's, the capital, ſituated in the NW. part of the iſland, which has water ſufficiently deep for merchant veſſels. The town of St John's was once in a very flouriſhing condition, as may be judged by the loſs ſuſtained at the fire in 1769, which was eſtimated at not leſs than L.400,000. This iſland was firſt attempted to be ſettled by Sir Thomas Warren, about the ſame time with St Chriſtopher's and Nevis; but no eſtabliſhment took place, till it was granted by Charles II. to Lord Willoughby, then governor of Barbadoes; who ſettled a colony upon it in the ſpace of a few years. In a ſhort time, but by what means is not evident, it became again the public property. It raiſes at preſent about 16,000 hogſheads of ſugar, which was at firſt of a very bad quality, but the planters have greatly improved their ſtaple ſince, and it is now as good as in any of the other iſlands. In 1787, no leſs than 254,706 cwt. was ſent from Antigua to Britain; but in 1790, only 65,200 cwt. The number of white inhabitants is reckoned about 10,000. Morſe, however, ſtates the number of whites at only 7000; but of the negroe ſlaves, at no leſs than 30,000! It is divided into 5 pariſhes, viz. 1. St John's town, which is reckoned the capital of the NW. part, and conſiſts of about 200 houſes; 2. Falmouth; 3. Porham, and 4. Bridge-town, on the S. ſide; and 5. St Peters, which is no town, but lies almoſt in the middle of the iſland. Lon. 62. 10. W. Lat. 17. 30. N.

ANTIGUGLER, is a crooked tube of metal, bent ſo as to be eaſily introduced into the necks of bottles, and uſed in decanting liquors, without diſturbing them. For this purpoſe the bottle ſhould be a little inclined, and about half a ſpoonful of the liquor poured out, ſo as to admit an equal quantity of air; let one end of the bent tube be ſtopped with the finger whilſt the other is thruſt into the body of the liquor near to the bubble of air already admitted. When the finger is taken off, the bottle will have vent, and the liquor will run out ſteadily and undiſturbed. See SIPHON.

ANTIHECTICS, [from ἀντὶ and ἕκτικος,] in pharmacy, medicines good in hectical diſorders.

ANTIHECTICUM POTERII, the name of a medicine formerly much celebrated, but now laid aſide in common practice. It was prepared from a mixture of tin with the regulus of antimony, and fixed with ſaltpetre.

ANTIHELIX. See ANTHELIX.

ANTIHYPNOTICS, [ἀντὶ and ὑπνωτικὸς, ſleepy,] medicines, that prevent ſleep.

ANTIHYPOCONDRIACS, [from ἀντὶ, and ὑποχονδριακὸς, hypochondriac,] medicines againſt melancholy.

ANTILEGOMENA, contradictions. *Bailey.*

ANTILEXIS, [from ἀντιλέγω, I contradict,] in antiquity, denotes a new trial granted in the Athenian judicatories, where judgment had before paſſed againſt a party for non-appearance.

ANTILIBANUS, in ancient geography, a mountain of Cœloſyria, which bounds it on the S. running parallel with Lybanus; they both begin a little above the ſea, Libanus near Tripolis, Antilibanus at Sidon; and both terminate near the mountains of Arabia, which run to the N. of Damaſcus, and the mountains of Traconites, and there end in other mountains. In the ſcriptures no diſtinction is made between Libanus and Antilibanus, both being denominated by the common name *Lebanon*.

ANTILLÆ, or ANTILLES, } Twenty eight iſlands, lying between the ſouthern and eaſtern part of the American continent, and belonging to the Engliſh, French, and Dutch. *Antilles* is the French name, but the natives call them CARRIBBEES; which ſee.

ANTILOEMICS, [from ἀντὶ and λοιμὸς, the peſtilence,] medicines againſt the plague.

* ANTILOGARITHM. *n. ſ.* [from ἀντὶ, againſt, and *logarithm*.]—The complement of the logarithm of a fine, tangent, or ſecant; or the difference of that logarithm from the logarithm of ninety degrees. *Chambers.*

(1.) * ANTILOGY. *n. ſ.* [ἀντιλογία.] A contradiction between any words and paſſages in an author. *Diſt.*

(2.) ANTILOGY. Tirinus has publiſhed a large index of the ſeeming antilogies in the Bible, i. e. of texts which apparently contradict each other, but which are all explained and reconciled by him in his comments on the Bible. Dom. Magri, a Malteſe of the oratory in Italy, has attempted the like; but he has done little more than rehearſe what occurs of that kind in the principal commentators.

ANTILOPE. See CAPRA.

* ANTILOQUIST. *n. ſ.* [from ἀντὶ, againſt, and *loquor*, to ſpeak.]—A contradictor. *Diſt.*

ANTILUTHERANS, a ſect among the ancient Reformers, who maintained opinions, chiefly in relation to the euchariſt, different from thoſe of Luther. Such were Caroloſtadius and his followers, called *Sacramentarians*; and thoſe of Zuinglius denominated *Zuinglians*. The ſect of Antilutherans, at firſt confined within narrow bounds, in a few years time ſubdivided into 6 or 7 inferior ſects, and ere long into an infinite number more variouſly denominated.

ANTILYSSUS PULVIS, in medicine, is compoſed of equal parts of the LICHEN *cinereus terreſtris et piper niger*. It is reckoned uſeful in preventing the rabies canina.

ANTIMENSIUM, a conſecrated table-cloth, occaſionally uſed in the Greek church, in places where there is no proper altar. F. Goar obſerves, that as the Greeks have but few conſecrated churches, and as conſecrated altars are not eaſily removed; that church has, for many ages, made uſe of certain conſecrated ſtuffs or linens, called antimenſia,

antimenſia, to ſerve the purpoſes thereof. The antimenſium, in the Greek church, anſwers to the *altare portabile*, or portable altar, in the Latin church. They are both only of late invention, though Habertus would have them as old as St Baſil. But Durant and Bona did not find them in any author before the time of Bede and Charlemagne. The word is alſo applied to other tables, uſed in offices of religion, beſides thoſe whereon the euchariſt is adminiſtered: ſuch as thoſe whereon the hoſt is expoſed, &c. The origin of the antimenſia is deſcribed by Meurſius. When the biſhop had conſecrated a church, the cloth which had been ſpread on the ground, and over the communion table, was torn in pieces, and diſtributed among the prieſts, who carried each a fragment away, to ſerve to cover the tables in their churches and chapels. Not that it was neceſſary that ſuch cloths ſhould be laid on all tables; but only on thoſe which either were not conſecrated, or at leaſt whoſe conſecration was doubted of!

ANTIMENSIUS, an ancient officer in the Greek church, whoſe buſineſs was to introduce and place the communicants at the euchariſt.—Some have imagined that he had the care of the antimenſia. But this rather belonged to the office of great *ſecrophylax*, who is otherwiſe called chief of the *antimenſii*.

ANTIMERIA, [from *ανθ* and *μερος*, a part,] in grammar, a figure where one part of ſpeech is uſed for another: e. gr. *velle ſuum cuique eſt*, for *voluntas ſui cuique eſt*; alſo *populus late rex*, for *populus late regnans*. Antimeria, in a more reſtrained ſenſe, is a figure whereby the noun is repeated inſtead of the pronoun. The antimeria is frequent in the Hebrew, and is ſometimes retained in our verſion of the Old Teſtament: e gr. "Hear my voice, ye wives *of Lamech*," for *my* wives. Gen. iv. 23.

ANTIMETABOLE, in rhetoric, a figure which ſets two things in oppoſition to each other. The word is Greek, compounded of *ανθ*, *againſt*, and *μεταβολη* from *μεταβαλλω*, I *ſhift* or *tranſfer*; *i. e.* a ſhifting, or ſetting two things over againſt each other. This figure is twice exemplified in an apophthegm of Muſonius; which, on account of its excellence, is called *aurum monitum*, the golden maxim or precept. *Αν τι πρᾶξῃς καλον μετα πονου, ὁ μεν πονος ωκυται, το δε καλον μενει. Αν τι πονηρον ανευ πονου πρᾶξῃς, το μεν ἡδυ ωκυται, το δε αισχρον μενει.* q. d. "Allowing the performance of an honourable action to be attended with labour; the labour is ſoon over, but the honour immortal; whereas, ſhould even pleaſure wait on the commiſſion of what is diſhonourable, the pleaſure is ſoon gone, but the diſhonour eternal."

ANTIMETATHESIS, [from *ανθ*, and *μεταθεσις*, *I tranſfer*,] in rhetoric, is the inverſion of the parts or members of an ANTITHESIS. Such is that of Cicero, againſt Verres, lib. iv. c. 52. "Compare this peace with that war; the arrival of this governor with the victory of that general; his profligate troops with the invincible army of the other; the luxury of the former with the temperance of the latter: you will ſay that Syracuſe was founded by him who took it; and taken by him who held it when founded."

ANTIMETRICAL, [from *ανθ*, and *μετρικος*, metrical,] contrary to the rules of verſe.

ANTIMISIUM, in antiquity, a table placed before the Roman tribunal, or judgment ſeat.—What relation this has to the antimenſia in the Greek church does not appear. Some writers ſuppoſe them the ſame.

ANTIMONARCHIAL. See next article.

*ANTIMONARCHICAL. *adj.* [from *ανθ* againſt, and *μοναρχια*, government by a ſingle perſon.] Againſt government by a ſingle perſon.—When he ſpied the ſtatue of King Charles in the middle of the croud, and moſt of the kings ranged over their heads, he concluded that an *antimonarchical* aſſembly could never chooſe ſuch a place. *Addiſon.*

*ANTIMONARCHICALNESS. *n. ſ.* [from *antimonarchical*.] The quality of being an enemy to regal power.

ANTIMONARCHIST, a perſon who maintains *antimonarchical* principles. Buchanan, Milton, Hottoman, Languet, Ludlow, Sydney, and others, are celebrated *antimonarchiſts*.

ANTIMONARCHOMACHI, } [from *ανθ*
ANTIMONARCHOMACHISTS, } *μοναρχος*, and *μαχη*, conteſt,] is uſed by ſome political writers to denote maintainers of monarchical or abſolute power veſted by divine right in the perſons of princes. In which ſenſe, *antimonarchomachi* ſtand oppoſed to *monarchomachi*. King James the firſt, Salmaſius, Peter du Moulin, biſhop Bramwell, Albericus Gentilis, Ziegler, William and George Barclay, Bochart, &c. have diſtinguiſhed themſelves in the claſs of *antimonarchomachiſts*. Acker has treated profeſſedly of the *monarchomachiſts* and *antimonarchomachiſts*.

(1.) * ANTIMONIAL. *adj.* [from *antimony*.] Made of antimony; having the qualities of antimony; relating to antimony.—They were got out of the reach of *antimonial* fumes. *Grew.*

(2.) ANTIMONIAL CUP, a cup, made either of glaſs of antimony, or of antimony prepared of ſalt petre. Though a ſubſtance indiſſoluble by the ſtomach, it will give a ſtrong cathartic or emetic quality to any liquor poured into it, without any diminution of its own weight.

ANTIMONIALS, in medicine, preparations of antimony. See PHARMACY, & ANTIMONY, § 5–24.

ANTIMONIATED, ſomething tinged with the qualities, or reſembling the appearances, of antimony. Dr Woodward ſpeaks of a kind of *antimoniated* lead ore.

(1.) * ANTIMONY. *n. ſ.* [The ſtibium of the ancients, by the Greeks called *στιμμι*. The reaſon of its modern denomination is referred to Baſil Valentine, a German monk; who, as the tradition relates, having thrown ſome of it to the hogs, obſerved, that, after it had purged them heartily, they immediately fattened; and therefore, he imagined, his fellow monks would be the better for a like doſe. The experiment, however, ſucceeded ſo ill, that they all died of it; and the medicine was thenceforward called *antimonie; antimonk*.] *Antimony* is a mineral ſubſtance, of a metalline nature, having all the ſeeming characters of a real metal, except malleability; and may be called a ſemimetal, being a foſſile glebe of ſome undetermined metal, combined with a ſulphurous and ſtony ſubſtance. Mines of all metals afford

it; that in gold mines is reckoned beſt. It has alſo its own mines in Hungary, Germany, and France. Its texture is full of brittle ſhining veins or threads, like needles; brittle as glaſs. Sometimes veins of a red or golden colour are intermixed, which is called *male antimony*; that without them being denominated *female antimony*. It fuſes in the fire, though with ſome difficulty; and diſſolves more eaſily in water. It deſtroys and diſſipates all metals fuſed with it, except gold; and is therefore uſeful in refining. It is a common ingredient in ſpeculums or burning concaves; ſerving to give them a finer poliſh. It makes a part in bell metal; and renders the ſound more clear. It is mingled with tin, to make it more hard, white and ſound; and with lead, in the caſting of printers' letters, to render them more ſmooth and firm. It is a general help in the melting of metals; and eſpecially in caſting of cannon balls. In pharmacy it is uſed under various forms, and with various intentions, chiefly as an emetick. *Chambers*.

(2.) ANTIMONY, FARTHER DESCRIPTION OF. This mineral is a blackiſh ſubſtance, ſtaining the hands, full of long, ſhining, needle like ſtriæ, hard, and conſiderably heavy. That antimony on which theſe ſtreaks are moſt diſtinct is eſteemed the beſt. Sometimes they are ranged with ſo much order, and branch out ſo regularly, that even thoſe who are moſt converſant with antimony, cannot but admire its beauty. It is found in other parts of Europe, beſides thoſe above mentioned, (§ 1.) as Bohemia, Saxony, Tranſylvania, and England, particularly in Cornwall; and commonly in mines by itſelf, intermixed with earth and ſtony matters. Sometimes it is blended with richer ores of ſilver, and renders the extraction of that metal difficult by volatilizing a part of the ſilver, or, in the language of the miners, *robbing the ore*. For the different operations reſpecting this ſemi-metal. See METALLURGY.

(3.) ANTIMONY, USES OF, AMONG THE ANCIENTS. Antimony at firſt was of ſervice only in the compoſition of paint. Scripture deſcribes it as a ſort of paint, with which the women blackened their eye brows. Jezebel, underſtanding that Jehu was to enter Samaria, painted her eyes with antimony; or according to the Hebrew, "put her eyes in antimony." As large black eyes were thought the fineſt, perſons of both ſexes, who were careful of their beauty, rubbed their eyes, eye-lids, and round the eyes, with a needle dipped in a box of paint made of antimony, with a deſign of blackening them. Iſaiah, in his enumeration of the ſeveral ornaments belonging to the daughters of Sion, has not forgot the needles which they made uſe of in painting their eyes and eye-lids. Nor has the practice eſcaped the laſh of Juvenal. Ezekiel, diſcovering the irregularities of the Jewiſh nation under the idea of a debauched woman, ſays, that ſhe bathed and perfumed herſelf, and that ſhe annointed her eyes with antimony. Job ſhows how much antimony was in eſteem, by calling one of his daughters a veſſel of antimony, or a box to put paint in, *cornu ſtibii*. The author of the book of Enoch ſays, that before the deluge, the angel Azleel taught young women the art of painting themſelves. Tertullian and St Cyprian have declaimed very warmly againſt this cuſtom of painting their eyes and eye-brows, which was much practiſed in Africa even by the men: *Inunge oculos tuos non ſtibio diaboli, ſed collyrio Chriſti*, ſays St Cyprian. Pliny, ſpeaking of the Roman ladies, ſays, that they painted their very eyes: *Tanta eſt decoris affectatio, ut tingantur oculi quoque*. Sardanapalus painted his eyes and eye-brows. Joſephus reproaches the ſeditious with the ſame, who aſſumed the name of zealots, and made themſelves maſters of the temple of Jeruſalem.

(4.) ANTIMONY, USES OF, AMONG THE MODERNS. Beſides the various uſes abovementioned by Dr Johnſon (§ 1.) antimony is applied to many other important purpoſes. It is made uſe of for purifying and heightening the colour of gold. See GOLD, PURIFICATION, &c. For a long time it was eſteemed poiſonous. In 1566, its uſe was prohibited in France by an edict of parliament; and in 1609, one Beſnier was expelled the faculty for having given it. The edict was repealed in 1650; antimony having a few years before been received into the number of purgatives. In 1668, a new edict came forth, forbidding its uſe by any but doctors of the faculty.—It is now univerſally allowed, that pure antimony in its crude ſtate has no noxious quality; and that though many of its preparations are moſt virulently emetic and cathartic, (See § 5, 6, 15, 16, 18,) yet, by a ſlight alteration or addition, they loſe their virulence, and become mild in their operations. See CHEMISTRY and PHARMACY. The virtues of antimony in the diſeaſes of animals are greatly extolled. Pigs that have the meaſles are at all times recovered by it, which proves it a great purifier of the blood. Horſes, that have running heels, which cannot be cured by the common methods uſed by the farriers, will generally be cured by this medicine in a little time. The manner of uſing it is this: Mix one dram with every feeding of oats which the horſe has in a morning. It is beſt put together in one place, buried under a few oats; and the horſe's head being withheld a little, and then let go juſt againſt that place, he will take it all in at a mouthful. Some horſes do not diſlike it; others obſtinately refuſe it, but to theſe it may be eaſily given in balls. The virtues of this drug in fattening of cattle has been thought imaginary, but experiment proves it to be truth. A horſe that is lean and ſcabby and not to be fatted by any other means, will become fat on taking a doſe of antimony every morning for two months together. A boar fed with brawn, and having an ounce of antimony given him every morning, will become fat a fortnight ſooner than others put into the ſtye at the ſame time, and fed in the ſame manner, but without the antimony. The ancient practice of uſing antimony as a pigment, is ſtill kept up by the women of Syria, Arabia, and Babylonia, or Irac-Arabia, who anoint and blacken themſelves about the eyes; and both men and women put black upon their eyes in the deſert, to preſerve them from the heat of the ſun. Darvieux tells us, that the Arbaian women border their eyes with a black colour made of tutty, which the Arabians call *rebel*. They draw a line of this kind of blacking

without

without the corner of their eyes, to make them appear larger.

(5.) ANTIMONY, BUTTER OF, is a white and thick liquor; otherwise called *icy oil of antimony*; compoſed of marine acid united into the reguline part of antimony, whence its property of attracting moiſture from the air, and its cauſticity. It is a fiery, corroſive, metallic ſalt, and a poiſon uſed internally. Externally it is applied as a cauſtic to cure gangrenes, cancers, &c.

(6.) ANTIMONY, CALX OF, a violent emetic, and purgative. The native calx of antimony was diſcovered by Mr Monge.

(7.) ANTIMONY, CERUSE OF, is the regulus diſtilled with ſpirit of nitre, in a ſand furnace. It is diaphoretic; and by many, is ſet on a footing with the mineral bezoar.

(8.) ANTIMONY, CINNABAR OF, is prepared of mercury, ſulphur, and antimony, mixed and ſublimed in a luted bolt head, and a naked fire. It is a good diaphoretic and alterative.

(9.) ANTIMONY, CLYSSUS OF. See CLYSSUS.

(10.) ANTIMONY, CROCUS OF, is the ſame with the *crocus metallorum*; excepting that this laſt is more mild and leſs emetic; being made by repeated lotions of the former, in warm water, and then drying it again to a powder. See CROCUS METALLORUM.

(11.) ANTIMONY, CRUDE, or antimony in ſubſtance, is the native mineral melted down and caſt in cones. It is uſed in decoctions of the woods, and in compoſitions againſt the ſcurvy, as a diaphoretic, and deobſtruent.

(12.) ANTIMONY, DIAPHORETIC, is prepared of antimony, powdered, and mixed with three times the quantity of nitre; and the mixture thrown, at ſeveral times, into an ignited crucible: upon which a detonation enſues. It is hereby bereaved of its emetic and purgative virtue, and rendered only diaphoretic. If the air have acceſs to it, it will again become emetic.

(13.) ANTIMONY, DIAPHORETIC NITRE OF, is aperitive, cooling, diuretic; and good in inflammatory fevers, &c.

(14.) ANTIMONY, ESSENCE OF. An emetic wine made with glaſs of antimony; to which is ſometimes added a ſpicy ſtomachic. Dr Huxham ſays, he never found any antimonial preparation, better, ſafer, and more efficacious than this ſimple infuſion of the glaſs of antimony in white wine, with a little ſpice to render it more grateful to the ſtomach. This medicine given in 20 or 30 drops, operates by gentle ſweats, and in larger doſes, purges very mildly. He recommends it in obſtinate rheumatiſms.

(15.) ANTIMONY, FLOWER OF, is antimony pulveriſed, and ſublimed in an aludel. It is a powerful emetic, and is of ſingular efficacy in maniac caſes; being the Herculean remedy, by which ſome have gained much reputation.

(16.) ANTIMONY, GLASS OF, *vitrum antimonii*, is crude antimony, ground and calcined by a vehement fire. It is the ſtrongeſt emetic of any preparation of antimony. Yet, if diſſolved in ſpirit of nitre, it ceaſes to be either emetic or cathartic; even though the menſtruum be afterwards drawn from it.

(17.) ANTIMONY, GOLDEN SULPHUR OF, is alſo called the *panacea* of antimony, and is ſaid to be the baſis of Lockyer's pills. It either proves emetic, cathartic, diuretic, or ſudorific, as its force happens to be determined.

(18.) ANTIMONY, LIVER OF. The calx, when fuſed and cooled, ſometimes becomes an opake brown maſs, which is called by this name. This is ſtrongly emetic.

(19.) ANTIMONY, MAGISTERY OF, is crude antimony digeſted with aqua regia 8 or 10 days; to which water is then put, but poured off again ere it ſettle. Its operation is rather cathartic than emetic, though ſometimes only ſudorific.

(20.) ANTIMONY, POWDER OF, is a mixture of two grains of emetic tartar, finely pulveriſed, with half a dram of any of the teſtaceous powders. This is a ſubſtitute for Dr James's febrifuge powder; and has the ſame virtues with the antimonial wine above deſcribed.

(21.) ANTIMONY PREPARED, is either crude antimony levigated, or that which has undergone ſome chemical proceſs, whereby its nature and powers are altered or abated.

(22.) ANTIMONY, REGULUS OF. See REGULUS.

(23.) ANTIMONY, REVIVIFIED, *antimonium reſuſcitatum*, is prepared of flowers of antimony and ſal ammoniac, digeſted in diſtilled vinegar: then exhaled, and the remainder ſweetened by ablution.—It is emetic, and ſometimes alſo ſudorific, and is good in maniacal caſes, &c.

(24.) ANTIMONY, TINCTURE OF. See TINCTURE.

ANTINE, Maur Francois d', a benedictine monk, was born at Gouvieux, in the dioceſe of Liege, in 1688. He publiſhed the firſt 5 volumes of Du Cange's Gloſſary, in 1736; beſides which, he was the author of a work, entitled, The Art of Verifying Dates, 4to, 1750; printed again in folio, 1770. He died in 1746.

* ANTINEPHRITICK. *adj.* [from ἀντι and νεφριτικός.] Medicines good againſt diſeaſes of the reins and kidneys.

ANTINOE. See ENFINE'.

ANTINOEIA, in antiquity, annual ſacrifices, and quinquennial games, in memory of Antinous the Bithynian, inſtituted at the command of Adrian, to be held at Mantinea in Arcadia. See ANTINOUS, N° 1.

ANTINOMASIA, a figure in rhetoric, where an appellation is uſed for a proper name.

ANTINOMIANS, in eccleſiaſtical hiſtory, certain heretics who maintain the law of no uſe or obligation under the goſpel diſpenſation, or who hold doctrines that clearly ſuperſede the neceſſity of good works and a virtuous life. The Antinomians took their origin from John Agricola about the year 1538; who taught, that the law is no ways neceſſary under the goſpel; that good works do not promote our ſalvation, nor ill ones hinder it; that repentance is not to be preached from the decalogue, but only from the goſpel. This ſect ſprung up in England during the protectorate of Oliver Cromwell, and extended their ſyſtem of libertiniſm much farther than Agricola the diſciple of Luther. Some of their preachers expreſsly maintained, that as the elect cannot fall from grace, nor forfeit the Divine favour, the wicked

actions they commit are not really ſinful, nor are to be conſidered as inſtances of their violation of the divine law; and conſequently they have no occaſion either to confeſs their ſins, or to break them off by repentance. According to them, it is one of the eſſential and diſtinctive characters of the elect, that they cannot do any thing which is either diſpleaſing to God, or prohibited by the law.—Luther, Rutherford, Schluſſelburg, Sedgwick, Gataker, Witſius, Bull, Williams, &c. have written refutations; Criſp, Richardſon, Saltmarſh, &c. defences of the Antinomians, and Wigandus, a compariſon between ancient and modern Antinomians. The doctrine of Agricola was in itſelf obſcure, and perhaps repreſented worſe than it really was by Luther, who wrote with acrimony againſt him, and firſt ſtyled him and his followers *Antinomians*. Agricola ſtood on his own defence, and complained that opinions were imputed to him which he did not hold. Nicholas Amſdorf fell under the ſame odious name and imputation, and ſeems to have been treated more unfairly than even Agricola himſelf. It is not fair to charge upon a man all the opinions that may be inferred from ſentiments, that have haſtily dropped from him, when he himſelf diſavows ſuch inferences.

* ANTINOMY. *n. ſ.* [from ἀντι, and νομος.] A contradiction between two laws, or two articles of the ſame law.—*Antinomies* are almoſt unavoidable in ſuch variety of opinions and anſwers, *Baker*.

(1.) ANTINOUS, the catamite of the emperor Adrian, born at Bithynus in Bithynia. His beauty engaged the heart of Adrian, in ſuch a manner, that there never was a more boundleſs and extravagant paſſion than he entertained for this youth. After his death, Adrian ordered divine honours to be paid to him! and named a city after him. See ENDYMION. Thus, this beaſtly emperor, not only "gloried in his ſhame," as the apoſtle expreſſes it, but immortalized it, and deified the deſpicable object of it! It evidences a dreadful degradation of the human intellect, that any people could be found mean enough, to comply with the imperial mandate, and to *worſhip* ſo contemptible a wretch!

(2.) ANTINOUS, in aſtronomy, a part of the conſtellation AQUILA.

ANTIO, a promontory in the pope's territories, in the middle diviſion of Italy, ſo named from the ancient city of Antium. It has a fortified tower, and a harbour was lately built near it.

(1.) ANTIOCH, a city of Syria, in Aſia, built on the river Orontes, by Seleucus Nicator, founder of the Syro-Macedonian empire, who made it his capital. It ſtood about 15 or 20 miles from the place where the Orontes empties itſelf into the Mediterranean; being equally diſtant from Conſtantinople and Alexandria in Egypt, that is, about 700 miles from each.

(2.) ANTIOCH, ANCIENT ACCOUNTS OF. Seleucus named this city Antioch, after his father; according to ſome; or his ſon, according to others. He built 16 other cities, bearing the ſame name; of which, one, ſituated in Piſidia, is probably that where the name of *Chriſtians* was firſt given to the followers of Jeſus Chriſt. But that ſituated on the Orontes, by far eclipſed, not only all the others of this name, but all the cities built by Seleucus. Antigonus, not long before, had founded a city in that neighbourhood, which from his own name he had called *Antigonia*, and deſigned it for the capital of his empire; but it was raſed to the ground by Seleucus, who employed the materials in building his metropolis, and alſo tranſplanted the inhabitants thither.—Antioch was afterwards known by the name of Tetrapolis, being divided, as it were, into four cities, each of them ſurrounded by its proper wall, beſides a common one, which incloſed them all. The firſt was the city built by Seleucus Nicator; the ſecond by thoſe who flocked thither, on its being made the capital of the Syro Macedonian empire; the third by Seleucus Callinicus; and the fourth by Antiochus Epiphanes. About 4 or 5 miles diſtant, ſtood a place called Daphne, which was nevertheleſs reckoned a ſuburb of Antioch. Here Seleucus planted a grove, and in the middle of it built a temple which he conſecrated to Apollo and Diana, making the whole an aſylum. To this place the inhabitants of Antioch reſorted for their pleaſures and diverſions; whereby it became at laſt ſo infamous, that "to live after the manner of Daphne," was uſed as a proverb to expreſs the moſt voluptuous and diſſolute way of living. Here Lucius Verus, the colleague of M. Aurelius, choſe to take up his reſidence, inſtead of marching againſt the Parthians; while his general Caſſius forbad by proclamation, any of his ſoldiers to enter or even go near the place. In ſhort, ſo remarkable was Daphne of old, that the metropolis itſelf was diſtinguiſhed by it, and called Antioch near Daphne.

(3.) ANTIOCH, ANCIENT HISTORY OF. Though Antioch continued to be, as Pliny calls it, the queen of the Eaſt, for near 1600 years; yet ſcarce any city, mentioned in hiſtory, hath undergone ſuch calamities, both from the attacks of its enemies, and its being naturally ſubject to earthquakes. The firſt diſaſter mentioned in hiſtory, which befel the Antiochians, happened about A. A. C. 145. Being at that time very much diſaffected to the perſon and government of Demetrius their king, they were continually raiſing tumults, inſomuch that he found himſelf at laſt obliged to ſolicit aſſiſtance from the Jews; and was furniſhed by Jonathan, one of the Maccabees, with 3000 men: by which reinforcement, believing himſelf ſufficiently ſtrong to reduce the mutineers by force, he ordered them immediately to deliver up their arms. This unexpected order cauſed a great uproar in the city. The inhabitants ran to arms, and inveſted the king's palace, to the number of 120,000, with a deſign to put him to death. All the Jews haſtened to his relief, fell upon the rebels, killed 100,000 of them, and ſet fire to the city. On the deſtruction of the Syrian empire by the Romans, Antioch ſubmitted to them, as well as the other cities of that kingdom, and continued for a long time under their dominion. About the year 115, in the reign of Trajan, it was almoſt entirely ruined by one of the moſt dreadful earthquakes mentioned in hiſtory. Trajan himſelf happened to be there at that time, being returned from an expedition a-

gainſt

gainſt the Parthians; ſo that the city was then full of troops, and ſtrangers came from all quarters, either out of curioſity, or upon buſineſs and embaſſies: the calamity was by this means felt almoſt in every province of the Roman empire.—The earthquake was preceded by violent claps of thunder, unuſual winds, and a dreadful noiſe under ground. The ſhock was ſo terrible, that great numbers of houſes were overturned, and others toſſed like a ſhip at ſea. Thoſe who happened to be in their houſes, were, for the moſt part, buried under their ruins: thoſe who were walking in the ſtreets, or in the ſquares, were, by the violence of the ſhock, daſhed againſt each other, and moſt of them either killed or dangerouſly wounded. This earthquake continued, with ſome ſmall intermiſſion, for many days and nights; ſo that vaſt numbers periſhed. The moſt violent ſhock, according to the acts of St Ignatius, was on a Sunday, December 23. By this Trajan was much hurt, but eſcaped through a window. Dio Caſſius pretends, that he was taken out of the window, by one who exceeded the human ſize in tallneſs. The ſame hiſtorian adds, that mount Liſon, which ſtood at a ſmall diſtance from the city, bowed its head, and threatened to fall upon it; that other mountains fell; that new rivers appeared; and others, that had flowed before, forſook their courſe and vaniſhed. When the earthquake ceaſed, a woman was heard crying under the ruins; which being immediately removed, ſhe was found with a living child in her arms. Search was made for others, but none were found alive, except one child, which continued ſucking its dead mother. Trajan, who was an eye witneſs of this terrible calamity, would doubtleſs contribute largely towards the re-eſtabliſhment of Antioch in its ancient ſplendor. Its good fortune, however, did not continue long; for in 155, it was almoſt entirely burnt by accidental fire; when it was again reſtored by Antoninus Pius. In 176, or 177, the inhabitants having ſided with Caſſius, the above mentioned Roman general, who had revolted from M. Aurelius, that emperor publiſhed a ſevere edict againſt them, deprived them of all their privileges, ſuppreſſed their public aſſemblies, and took from them the ſhews and ſpectacles, to which they were greatly addicted: but his anger being ſoon appeaſed, he reſtored them to their former condition, and even condeſcended to viſit their city. In 194, having ſided with Niger againſt Severus, the latter deprived them of all their privileges, and ſubjected Antioch, as a mere village, to Laodicea; but, however, pardoned them the next year, at the intreaties of his eldeſt ſon, then a child.

(4.) ANTIOCH, MODERN HISTORY OF. When the Roman empire began to decline, Antioch became the bone of contention between them and the eaſtern nations; and accordingly, on the breaking out of a Perſian war, it was almoſt always ſure to ſuffer. In 242 it was taken and plundered by Sapor; and, though he was defeated by Gordian, it underwent the ſame misfortune, in the time of Valerian, about 18 years after; and after the defeat and captivity of Valerian, being taken by the Perſian monarch, a third time, he not only plundered it, but levelled all the public buildings with the ground. The Perſians, however, being ſoon driven out, this unfortunate city continued free from any remarkable calamity, till about the time of the diviſion of the Roman empire, by Conſtantine, in 331. It was then afflicted with ſo great a famine, that a buſhel of wheat was ſold for 400 pieces of ſilver. During this diſtreſs, Conſtantine ſent to the biſhop 30,000 buſhels of corn, beſides an incredible quantity of all kinds of proviſions, to be diſtributed among the eccleſiaſtics, widows, orphans, &c. In the year 347, Conſtantine II. cauſed an harbour to be made at Seleucia, for the conveniency of Antioch.—This was effected at an immenſe expence, the mouth of the Orontes, where the port was made, being full of ſands and rocks. When the emperor Julian ſet out on his expedition againſt the Perſians, he made a long ſtay at Antioch; during which time, many of the Roman provinces were afflicted with a famine, but which raged more violently in Antioch than in any other place. The eccleſiaſtical writers of thoſe times ſay, that this famine followed Julian from place to place; and as he continued longer at Antioch than any other city, it raged more violently there than any where elſe. To remedy this evil, Julian fixed the price of corn; by which means, the famine was greatly increaſed, the merchants conveying their corn privately to other places, ſo that this metropolis was reduced to a moſt deplorable ſituation. In 381, in the reign of Theodoſius the Great, Antioch was again viſited by a famine, accompanied with a grievous plague. The latter ſoon ceaſed; but the famine ſtill continuing, the biſhop, Libanius, applied to Icarius, count of the Eaſt, requeſting him, by ſome means or other, to relieve the poor, who had flocked from all parts to the metropolis, and were daily periſhing in great numbers; but to this Icarius gave no other anſwer, than that they were abhorred, and juſtly puniſhed by the gods. This inhuman anſwer raiſed great diſturbances, which, however, were terminated without bloodſhed. In 387, Theodoſius finding his exchequer quite drained, and being obliged to be at an extraordinary expence in celebrating the fifth year of the reign of his ſon Arcadius, and the tenth of his own, an extraordinary tax was laid upon all the people in the empire. Moſt of the cities ſubmitted willingly to this; but the people of Antioch, complaining of it as an unreaſonable oppreſſion, crowded to the houſe of Flavianus their biſhop, as ſoon as the edict was publiſhed, to implore his protection.—Being unable to find him, they returned to the forum, and would have torn the governor in pieces, had not the officers who attended him kept back, with great difficulty, the enraged multitude, till he made his eſcape. Upon this, they broke ſome of the emperor's ſtatues, and dragged others through the city, uttering the moſt injurious and abuſive expreſſions againſt him and his whole family. They were, however, diſperſed by a body of archers, who, by wounding only two of the rabble, ſtruck terror into all the reſt. The governor proceeded againſt the offenders with the utmoſt cruelty; expoſing ſome to wild beaſts in the theatre, and burning others alive

active. He did not spare even the children, who had insulted the emperor's statues; and caused several persons to be executed, who had only been spectators of the disorder. In the mean time, a report was spread, that a body of troops was at hand, with orders to plunder the city, and put all to the sword, without distinction of sex or age; upon which the citizens abandoned their dwellings in the utmost terror and confusion, retiring to the neighbouring mountains with their wives and families. As the report proved groundless, some of them returned; but the greater part, dreading the cruelty of the governor, and the displeasure of the emperor, continued in their retreats. To those who returned, St Chrysostom preached some homilies, which have reached our times, and are greatly admired; and which are said by St Chrysostom himself, as well as some cotemporary writers, to have had a considerable effect in reforming the lives of this licentious and dissolute people. On hearing the news of this tumult, Theodosius was so much enraged, that he commanded the city to be destroyed, and its inhabitants to be put to the sword without distinction; but this order was revoked before it could be put in execution, and he contented himself with a punishment similar to that inflicted by Severus above mentioned. (§ 3.) He appointed judges to punish the offenders, who proceeded with such severity, and condemned such numbers, that the city was thrown into the utmost consternation. On this occasion, St Chrysostom and the hermits, who were very numerous in the neighbourhood, exerted all their eloquence in behalf of the unhappy people, and obtained a respite for those who had been condemned. They next proceeded to draw up a memorial to the emperor in favour of the citizens in general; and being joined by Flavianus, at last obtained a general pardon, and had the city restored to all its former privileges. In 458, Antioch was almost entirely ruined by an earthquake, which happened on the 14th of September; scarce a single house being left standing in the most beautiful quarter of the city. A similar misfortune happened in 525, during the reign of the emperor Justin; and 15 years after, being taken by Cosrhoes king of Persia, that haughty tyrant gave it up to his soldiers, who put all they met to the sword: The king himself seized on all the gold and silver vessels belonging to the great church; and caused all the valuable statues, pictures, &c. to be taken down and conveyed to Persia, while his soldiers carried off every thing else. The city being thus completely plundered, Cosrhoes ordered his men to set fire to it; which was accordingly done so effectually, that none of the buildings even without the walls escaped. Such of the inhabitants as escaped slaughter were carried into Persia, and sold as slaves. Notwithstanding such great and repeated calamities, the city of Antioch soon recovered its ancient splendor; but in a short time underwent its usual fate, being almost entirely reduced by an earthquake in 587, by which 30,000 persons lost their lives. In 634, it fell into the hands of the Saracens, who kept possession of it till the year 858, when it was surprised by one Burtzas, and again annexed to the Roman empire. The Romans continued masters of it for some time, till the civil dissentions in the empire gave the Turks an opportunity of seizing upon it, as well as the whole kingdom of Syria. From them it was again taken by the Crusader in 1098. In 1262, it was taken by Bibarus sultan of Egypt, who put a final period to its glory.

(§.) ANTIOCH, PRESENT STATE OF. Antioch, which is now called ANTHAKIAH, is no more than a ruinous town, whose houses, built with mud and straw, and narrow and miry streets, exhibit every appearance of misery and wretchedness. These houses are situated on the southern bank of the Orontes, at the extremity of an old decayed bridge: they are covered to the south by a mountain, upon the slope of which is a wall built by the crusaders. The distance between the present town and this mountain is about 400 yards, which space is occupied by gardens and heaps of rubbish, but presents nothing interesting. Notwithstanding the unpolished manners of its inhabitants, Antioch was better calculated than Aleppo to be the emporium of the Europeans. By clearing the mouth of the Orontes, which is six leagues lower down, boats might have been towed up that river, though they could not have sailed up, as Pococke has asserted; its current is too rapid. The natives, who never knew the name Orontes, call it, on account of the swiftness of its stream, *El-aasi*, or the *Assi*, that is, the rebel. Its breadth, at Antioch, is about 40 paces. Seven leagues above that town, it passes by a lake abounding in fish, and especially in eels. A great quantity of these are salted every year, but not sufficient for the numerous fasts of the Greek Christians. We no longer hear at Antioch, either of the Grove, or Daphne, or of the voluptuous scenes of which it was the theatre. The plain of Antioch, though the soil of it is excellent, is uncultivated, and abandoned to the Turkomans; but the hills on this side of the Orontes, opposite Serkin, abound in plantations of figs and olives, vines, and mulberry trees, which, (a thing uncommon in Turkey,) are planted in quincunx, and exhibit a landscape worthy our finest provinces. Seleucus Nicator, when he founded Antioch, built at the mouth of the Orontes, on the northern bank, a large and well fortified city, which bore his name, but of which at present not a single habitation remains: nothing is to be seen but heaps of rubbish, and works in the adjacent rock, which prove that this was once a place of considerable importance. In the sea also may be perceived the traces of two piers, which are indications of an ancient port, now choaked up. The inhabitants of the country go thither to fish, and call the name of the place *Souaidia*. Antioch is situated 5 miles S. of Scanderoon, 40 SW. of Aleppo, and 15 E. of the Mediterranean. Lon. 36. 45. E. Lat. 35. 17. N.

(II.) ANTIOCH, the capital of Pisidia, where Paul and Barnabas, permitted by the ruler of the Jewish synagogue, preached the gospel, till the Jews raised a persecution against them. See Acts xxiii. 14—50.

ANTIOCHEA. See ANTIOCHIA.

ANTIOCHETTA, a town of Turkey, in Asia, in Caramania, with a bishop's see, over against the island of Cyprus. Lon. 32. 15. E. Lat. 36. 42. N.

ANTIO-

ANTIOCHIA, in ancient geography; the name of many towns; viz. 1. a town of Aſſyria, ſituated between the rivers Tigris and Tornadotus: 2. of Caria, on the Meander; called alſo *Ptilopolis*, *Athmybra*, and *Nyſſa*, or *Nyſa*; by Stephanus; but Strabo ſays, that Nyſa was near Tralles: 3. of Cilicia Trachea, on mount Cragus: 4. the capital of Syria, diſtinguiſhed from the cities of the ſame name either by its ſituation on the Orontes, by which it was divided, or by its proximity to Daphne, hence called *Epidaphnes*; (See ANTIOCH, N° I.) 5. a town of Comagene, on the Euphrates: 6. of Lydia; called alſo *Tralles*, by Pliny: 7. of Margiana on the river Margus, named from Antiochus, ſon of Seleucus, who rebuilt it, and walled it round, being before called *Alexandria*, from Alexander; in compaſs 70 ſtadia; whether Orodes carried the Romans, after the defeat of Craſſus: 8. in Meſopatamia, on the like Callirrhoe, the old name of Edeſſa: 9. on the river Mygdonius, in Meſopotamia, ſituated at the foot of mount Maſius, and the ſame with Niſibis: it was the bulwark and frontier town of the Romans againſt the Parthians and Perſians, till given up to the Perſians by Jovian, by an ignominious peace: 10. the capital of Piſidia, a Roman colony with the appellation *Cæſarea*; (See ANTIOCH, N° II.): 11. at mount Taurus, mentioned by Ptolemy, but by no other author.

ANTIOCHIAN ACADEMY, or SECT, a name given to the fifth academy, or branch of academies. It took this denomination from its being founded by ANTIOCHUS, the philoſopher. (See N° 1.) The Antiochian academy ſucceeded the Philonian. As to doctrine the philoſophers of this ſect appear to have reſtored that of the ancient academy, except that in the article of the criterion of truth, Antiochus was really a ſtoic, and only nominally an academic.

ANTIOCHIAN EPOCHA, a method of computing time from the proclamation of liberty granted the city of Antioch, about the time of the battle of Pharſalia.

(1.) ANTIOCHUS of Aſcalon, a celebrated philoſopher, the diſciple of Philo of Lariſſa, the maſter of Cicero, and the friend of Lucullus and Brutus. He was founder of a fifth academy; but, inſtead of attacking other ſects, he endeavoured to reconcile them together, particularly the ſect of the ſtoics with that of the ancient academy.

(2.) ANTIOCHUS, the name of thirteen kings of SYRIA. See that article.

ANTIOPE, in fabulous hiſtory, 1. The wife of Lycus, king of Thebes, who, being deflowered by Jupiter in the form of a ſatyr, brought forth Amphion and Zethus: 2. A queen of the Amazons, who with the aſſiſtance of the Scythians, invaded Athens; but was vanquiſhed by Theſeus, who married her.

ANTIPACHSU, a ſmall iſland near the coaſt of European Turkey, ſubject to Venice.

ANTIPÆDOBAPTISTS, [from ἀντι, againſt παις, παιδος, child, and βαπτιζω, baptize, whence βαπτισται,] a denomination given to thoſe who object to the baptiſm of infants; becauſe they ſay, infants are incapable of being inſtructed, and of making that profeſſion of faith which intitles them to this ordinance and an admiſſion into church communion. See BAPTISTS.

ANTIPAGMENTS. See ANTEPAGMENTA.

ANTIPAPINUS, or ANTIPAPINIANUS, [ἀντιπαπινιανος], a title given by the Greek lawyers to the fourth part of the Digeſt, including four books, beginning with the title *De pignoribus*. It was ſo denominated, not as being in oppoſition to Papinian, becauſe it ſerved in the ſchools in lieu of the books of that lawyer, purſuant to an edict of Juſtinian.

ANTIPARALLELS, in geometry, are thoſe lines joining the two legs of an angle, which make the ſame angles like parallel lines, but in oppoſite directions. M. Leibnitz, however calls thoſe lines antiparallels, which cut two parallels ſo, that the outward angle being added to the inward one, the ſum may be equal to a right angle.

* ANTIPARALYTICK. *adj.* [from ἀντι and παραλυσις.] Efficacious againſt the palſy.

ANTIPARASIASIS, in rhetoric, a figure by which one, granting ſomething to his opponent, thereby turns it to deny more ſtrongly.

ANTIPARASTASIS, [from ἀντι and παραστασις, of παριστημι, I exhibit,] in rhetoric, a reply made to an opponent by allowing part of his argument, and denying the reſt, e. g. "you may paint what ever you pleaſe, provided the public ſuffer no prejudice from it; but you muſt not if it does."

(1.) ANTIPAROS, an iſland in the Archipelago, oppoſite to Paros, in a weſtern direction, and from which it is ſeparated by a ſtrait about 7 miles over. It is the *Olearos* or *Oliaros*, mentioned by Strabo, Pliny, Virgil, Ovid, &c.; and was, according to Heraclides Ponticus, as quoted by Stephanus, firſt peopled by a Phœnician colony from Sidon.—According to Mr Tournefort's account, it is about 16 miles in circumference, produces a little wine and cotton, with as much corn as is neceſſary for the maintenance of 60 or 70 families, who live together in a village at one end of the iſland, and are moſtly Malteſe and French corſairs. Lon. 25. 50. E. Lat. 37. 40. N. See § 2 and 3.

(2.) ANTIPAROS, CAVERN OF. This iſland is remarkable for a ſubterraneous cavern or grotto, accounted one of the greateſt natural curioſities in the world. It was firſt diſcovered in the laſt century by one Magni an Italian traveller, who has given us the following account. "Having been informed (ſays he) by the natives of Paros, that in the little iſland of Antiparos, which lies about two miles from the former, of a gigantic ſtatue that was to be ſeen at the mouth of a cavern in that place, it was reſolved that we (the French conſul and himſelf) ſhould pay it a viſit. In purſuance of this reſolution, after we had landed on the iſland, and walked about four miles through the midſt of beautiful plains and ſloping woodlands, we at length came to a little hill, on the ſide of which yawned a moſt horrid cavern, that with its gloom at firſt ſtruck us with terror, and almoſt repreſſed curioſity. Recovering the firſt ſurpriſe, however, we entered boldly; and had not proceeded above 20 paces, when the ſuppoſed ſtatue of the giant preſented itſelf to our view. We quickly perceived, that what the ignorant natives had been terrified at as a giant, was nothing more than

than a ſparry concretion, formed by the water dropping from the roof of the cave, and by degrees hardening into a figure that their fears had formed into a monſter. Incited by this extraordinary appearance, we were induced to proceed ſtill further, in queſt of new adventurers in this ſubterranean abode. As we proceeded, new wonders offered themſelves: the ſpars, formed into trees and ſhrubs, preſented a kind of petrified grove; ſome white, ſome green; and all receding in due perſpective. They ſtruck us with the more amazement, as we knew them to be mere productions of Nature, who, hitherto in ſolitude, had, in her playful moments, dreſſed the ſcene, as if for her own amuſement. But we had as yet ſeen but a few of the wonders of the place; and we were introduced as yet only into the portico of this amazing temple. In one corner of this half-illuminated receſs, there appeared an opening of about three feet wide, which ſeemed to lead to a place totally dark, and that one of the natives aſſured us contained nothing more than a reſervoir of water. Upon this we tried, by throwing down ſome ſtones, which rumbling along the ſides of the deſcent for ſome time, the ſound ſeemed at laſt quaſhed in a bed of water. In order, however, to be more certain, we ſent in a Levantine mariner, who, by the promiſe of a good reward, with a flambeau in his hand, ventured into this narrow aperture. After continuing within it for about a quarter of an hour, he returned, carrying ſome beautiful pieces of white ſpar in his hand, which art could neither imitate nor equal. Upon being informed by him that the place was full of theſe beautiful incruſtations, I ventured in once more with him, for about 50 paces, anxiouſly and cautiouſly deſcending by a ſteep and dangerous way. Finding, however, that we came to a precipice which led into a ſpacious amphitheatre, if I may ſo call it, ſtill deeper than any other part, we returned; and being provided with a ladder, flambeaux, and other things to expedite our deſcent, our whole company, man by man, ventured into the ſame opening, and, deſcending one after another, we at laſt ſaw ourſelves altogether in the moſt magnificent part of the cavern. Our candles being now all lighted up, and the whole place completely illuminated, never could the eye be preſented with a more glittering or a more magnificent ſcene. The roof all hung with ſolid icicles, tranſparent as glaſs, yet ſolid as marble. The eye could ſcarce reach the lofty and noble cieling; the ſides were regularly formed with ſpars; and the whole preſented the idea of a magnificent theatre, illuminated with an immenſe profuſion of lights. The floor conſiſted of ſolid marble; and in ſeveral places, magnificent columns, thrones, altars, and other objects, appeared, as if nature had deſigned to mock the curioſities of art. Our voices, upon ſpeaking or ſinging, were redoubled to an aſtoniſhing loudneſs; and, upon the firing of a gun, the noiſe and reverberations were almoſt deafening. In the midſt of this grand amphitheatre roſe a concretion of about 15 feet high, that, in ſome meaſure, reſembled an altar, from which, taking the hint, we cauſed maſs to be celebrated there. The beautiful columns that ſhot up round the altar, appeared like candleſticks; and many other natural objects repreſented the cuſtomary ornaments of this ſacrament. Below even this ſpacious grotto, there ſeemed another cavern; down which I ventured with my former mariner, and deſcended about 50 paces by means of a rope. I at laſt arrived at a ſmall ſpot of level ground, where the bottom appeared different from that of the amphitheatre, being compoſed of ſoft clay, yielding to the preſſure, and in which I thruſt a ſtick to about ſix feet deep. In this, however, as above, numbers of the moſt beautiful cryſtals were formed; one of which, particularly, reſembled a table. Upon our egreſs from this amazing cavern, we perceived a Greek inſcription upon a rock at the mouth; but obliterated by time, that we could not read it. It ſeemed to import, that one Antipater, in the time of Alexander, had come thither; but whether he penetrated into the depths of the cavern, he does not think fit to inform us." From this account Mr Tournefort's differs conſiderably. Mr Magni mentions only one deſcent or precipice from the entry of the cave to the grotto, or moſt magnificent part: Mr Tournefort ſays that there were many very dangerous precipices and rugged ways, through which they were obliged to paſs ſometimes on their back and ſometimes on their belly; but gives no particular account of his journey till he comes to the grand cavern. This indeed he deſcribes very pompouſly; but as by it he evidently wants to ſupport a favourite hypotheſis, namely, the vegetation of ſtones, perhaps the particulars are not altogether to be depended upon. He informs us, that, at the entry into the cavern, he met with a Greek inſcription almoſt defaced, containing a good number of proper names; and that there was a tradition among the inhabitants, that theſe were the names of ſome who had conſpired againſt Alexander the Great, and having miſſed their aim, had taken refuge in this grotto.

(3.) ANTIPAROS, CAVERN OF, FARTHER DESCRIBED. The moſt particular account, however of this famous grotto that hath hitherto been publiſhed, appeared in the Britiſh magazine, in a letter ſigned Charles Saunders, and dated Feb. 24th, 1756-7; which, as it is very particular, and ſeems to bear ſufficient marks of authenticity, we ſhall here inſert. "Its entrance lies in the ſide of a rock, about two miles from the ſea-ſhore: and is a ſpacious and very large arch, formed of rough craggy rocks, overhung with brambles and a great many climbing plants, that give it a gloominеſs which is very awful and agreeable. Our ſurgeon, myſelf, and four paſſengers, attended by ſix guides with lighted torches, entered this cavern about 8 o'clock in the morning, in the middle of Auguſt laſt. We had not gone 20 yards in this cavity, when we loſt all ſight of day light; but our guides going before us with lights, we entered into a low narrow kind of alley ſurrounded every way with ſtones all glittering like diamonds by the light of our torches; the whole being covered and lined throughout with ſmall cryſtals, which gave a thouſand various colours by their different reflections. This alley grows lower and narrower as one goes on till at length one can ſcarce get along it. At the end of this paſſage we were each of us preſented with a rope to tie about our middles: which

when we had done, our guides led us to the brink of a moſt horrible precipice. The deſcent into this was quite ſteep, and the place all dark and gloomy. We could ſee nothing, in ſhort, but ſome of our guides with torches, in a miſerable dark place, at a vaſt diſtance below us. The dreadful depth of this place, and the horror of the deſcent through a miſerable darkneſs into it, made me look back to the lane of diamonds, if I may ſo call it, through which we had juſt paſſed; and I could not but think I was leaving heaven, to deſcend into the infernal regions. The hope of ſomething fine at my journey's end, tempted me, however, to truſt myſelf to the rope and my guides at the top, to let myſelf down. After about two minutes dangling in this poſture, not without much pain as well as terror, I found myſelf ſafe, however at the bottom; and our friends all ſoon followed the example. When we had congratulated here with one another on our ſafe deſcent; I was inquiring where the grotto, as they called it, was. Our guides, ſhaking their heads, told us, we had a great way to that yet; and led us forward about 10 yards under a roof of ragged rocks, in a ſcene of terrible darkneſs, and at a vaſt depth from the ſurface of the earth, to the brink of another precipice, much deeper and more terrible than the former. Two of the guides went down here with their torches firſt; and by their light, we could ſee, that this paſſage was not ſo perpendicular indeed as the other, but lay in a very ſteep ſlant, with a very ſlippery rock for the bottom; vaſt pieces of rough rugged rock jutting out in many places on the right hand, in the deſcent, and forcing the guides ſometimes to climb over, ſometimes to creep under them, and ſometimes to go round them; and on the left a thouſand dark caverns, like ſo many monſtrous wells, ready, if a foot ſhould ſlip, to ſwallow them up for ever. We ſtood on the edge to ſee theſe people with their lights deſcend before us; and were amazed and terrified to ſee them continue deſcending till they ſeemed at a monſtrous and moſt frightful depth. When they were at the bottom, however, they hallowed to us; and we, trembling and quaking, began to deſcend after them. We had not gone 30 feet down, when we came to a place where the rock was perfectly perpendicular; and a vaſt cavern ſeemed to open its mouth to ſwallow us up on one ſide, while a wall of rugged rock threatened to tear us to pieces on the other. I was quite diſheartened at this terrible proſpect, and declared I would go back; but our guides aſſured us that there was no danger; and the reſt of the company reſolving to ſee the bottom now they were come ſo far, I would not leave them: ſo on we went to a corner where there was placed an old ſlippery and rotten ladder, which hung down cloſe to the rock; and down this, one after another, we at length all deſcended. When we had got to the bottom of this we found ourſelves at the entrance of another paſſage, which was terrible indeed; but in this there was not wanting ſomething of beauty. This was a wide and gradual deſcent; at the entrance of which one of our guides ſeated himſelf on his breech, and began to ſlide down, telling us we muſt do the ſame. We could diſcover, by the light of his torch, that this paſſage was one of the nobleſt vaults in the world. It is about nine feet high, ſeven wide, and has for its bottom a fine green gloſſy marble. The walls and arch of the roof of this being as ſmooth and even in moſt places as if wrought by art, and made of a fine gliſtering red and white granite, ſupported here and there with a deep blood-red ſhining porphyry, made with the reflection of the lights, an appearance not to be conceived. This paſſage is at leaſt 40 yards long; and of ſo ſteep a deſcent, that one has enough to do, when ſeated on one's breech, not to deſcend too quickly. Our guides, that we kept with us, could here keep on each ſide of us; and, what with the prodigious grandeur and beauty of the place, our eaſy travelling through it, and the diverſion of our now and then running over one another whether we would or not; this was much the pleaſanteſt part of our journey. When we had entered this paſſage, I imagined we ſhould at the bottom join the two guides we had firſt ſet down: but alas! when we were got there, we found ourſelves only at the mouth of another precipice, down which we deſcended by a ſecond ladder not much better than the former. I could have admired this place alſo, would my terror have ſuffered me; but the dread of falling, kept all my thoughts employed during my deſcent. I could not but obſerve, however, as my companions were coming down after me, that the wall, if I may ſo call it, which the ladder hung by, was one maſs of blood-red marble covered with white ſprigs of rock-cryſtal, as long as my finger, and making, with the glow of the purple from behind, one continued immenſe ſheet of amethiſts. From the foot of this ladder we ſlided on our bellies through another ſhallow vault of poliſhed green and white marble, about 20 feet; and at the bottom of this joined our guides. Here we all got together once again, and drank ſome rum, to give us courage before we proceeded any farther. After this ſhort refreſhment, we proceeded by a ſtrait, but ſomewhat ſlanting paſſage, of a rough, hard, and ſomewhat coarſe ſtone, full of a thouſand ſtrange figures of ſnakes rolled round, and looking as if alive; but in reality as cold and hard as the reſt of the ſtone, and nothing but ſome of the ſtone itſelf in that ſhape. We walked pretty eaſily along this deſcent for near 200 yards; where we ſaw two pillars ſeemingly made to ſupport the roof from falling in: but in reality it was no ſuch thing; for they were very brittle, and made of a fine glittering yellow marble. When we had paſſed theſe about 200 yards, we found ourſelves at the brink of another very terrible precipice: but this our guides aſſured us was the laſt; and there being a very good ladder to go down by, we readily ventured. At the bottom of this ſteep wall, as I may call it, we found ourſelves for ſome way upon plain even ground; but, after about 40 yards walking, were preſented by our guides with ropes again; which we faſtened about our middles, though not to be ſwung down by, but only for fear of danger, as there are lakes and deep waters all the way from hence on the left hand. With this caution, however, we entered the laſt alley; and horrible work it was indeed to get thro' it. All was perfectly horrid and diſmal here. The ſides and roof of the paſſage were all of black

ſtone; and the rocks in our way were in ſome places ſo ſteep, that we were forced to lie all along on our backs, and ſlide down; and ſo rough, that they cut our clothes, and bruiſed us miſerably in paſſing. Over our heads, there were nothing but ragged black rocks, ſome of them looking as if they were every moment ready to fall in upon us; and, on our left hand, the light of our guides' torches ſhowed us continually the ſurfaces of dirty and miſerable looking lakes of water. If I had heartily repented of my expedition often before, here I aſſure you I was all in a cold ſweat, and fairly gave myſelf over for loſt; heartily curſing all the travellers that had written of this place, that they had deſcribed it ſo as to tempt people, to ſee it, and never told us of the horrors that lay in the way. In the midſt of all theſe reflections, and in the very diſmalleſt part of all the cavern, on a ſudden we had loſt four of our ſix guides. What was my terror on this ſight! The place was a thouſand times darker and more terrible for want of their torches; and I expected no other but every moment to follow them into ſome of theſe lakes, into which I doubted not but they were fallen. The remaining two guides ſaid all they could, indeed, to cheer us up; and told us we ſhould ſee the other four again ſoon, and that we were near the end of our journey. I don't know what effect this might have upon the reſt of my companions; but I aſſure you I believed no part of the ſpeech but the laſt, which I expected every moment to find fulfilled in ſome pond or precipice. Our paſſage was by this time become very narrow, and we were obliged to crawl on all fours over rugged rocks; when in an inſtant, and in the midſt of theſe melancholy apprehenſions, I heard a little hiſſing noiſe, and ſaw myſelf in utter, and not to be deſcribed darkneſs. Our guides called indeed chearfully to us, and told us that they had accidentally dropped their torches into a puddle of water, but we ſhould ſoon come to the reſt of them, and they would light them again; and told us there was no danger, and we had nothing to do but to crawl forward. I cannot ſay but I was amazed at the courage of theſe people; who were in a place where, I thought, four of them had already periſhed, and from whence we could none of us ever eſcape; and determined to lie down and die where I was. Words cannot deſcribe the horror, or the extreme darkneſs, of the place. One of our guides, however, perceiving that I did not advance, came up to me, and clapping his hand firmly over my eyes, dragged me a few paces forward. While I was in this ſtrange condition, expecting every moment death in a thouſand ſhapes, and trembling to think what the guide meant by this rough proceeding, he lifted me at once over a great ſtone, ſet me down on my feet, and took his hand from before my eyes. What words can deſcribe at that inſtant my aſtoniſhment and tranſport! Inſtead of darkneſs and deſpair, all was ſplendor and magnificence before me; our guides all appeared about us; the place was illuminated by 50 torches, and the guides all welcomed me into the grotto of Antiparos. The four that were firſt miſſing, I now found had only given us the ſlip, to get the torches lighted before we came; and the two had put out their lights on purpoſe, to make us enter out of utter darkneſs into this pavilion of ſplendor and glory. I am now come to the proper buſineſs of this letter; which was, to deſcribe this grotto. But I muſt confeſs to you that words cannot do it. The amazing beauties of the place, the eye that ſees them only can conceive. The beſt account I can give you, however, pray accept of." See § 4.

(4.) ANTIPAROS, THE GROTTO OF, DESCRIBED. "The people told us, the depth of this place was 485 yards. The grotto, in which we now were, is a cavern of 120 yards wide, and 113 long, and ſeems about 60 yards high in moſt places. Theſe meaſures differ ſomething from the accounts travellers in general give us; but you may depend upon them as exact, for I took them with my own hand. Imagine, then, an immenſe arch like this, almoſt all over lined with fine and bright chryſtallized white marble, and illuminated with 50 torches; and you will then have ſome faint idea of the place I had the pleaſure to ſpend three hours in. This, however, is but a faint deſcription of its beauties. The roof, which is a fine vaulted arch, is hung all over with icicles of white ſhining marble, ſome of them ten feet long, and as thick as one's middle at the root: and among theſe there hang 1000 feſtoons of leaves and flowers of the ſame ſubſtance; but ſo very glittering, that there is no bearing to look up at them. The ſides of the arch are planted with ſeeming trees of the ſame white marble, riſing in rows one above another, and often incloſing the points of the icicles. From theſe trees there are alſo hung feſtoons, tied as it were from one to another in vaſt quantities; and in ſome places among them there ſeem rivers of marble winding through them in a thouſand meanders. All theſe things are only made, in a long courſe of years, from the dropping of water, but really look like trees and brooks turned to marble. The floor we trod upon was rough and uneven, with cryſtals of all colours growing irregularly out of it, red, blue, green, and ſome of a pale yellow. Theſe were all ſhaped like pieces of ſaltpetre; but ſo hard, that they cut our ſhoes: among theſe, here and there, are placed icicles of the ſame white ſhining marble with thoſe above, and ſeeming to have fallen down from the roof and fixed there; only the big end of theſe is to the floor. To all theſe our guides had tied torches, two or three to a pillar, and kept continually beating them to make them burn bright. You muſt gueſs what a glare of ſplendor and beauty muſt be the effect of this illumination among ſuch rocks and columns of marble. All round the lower part of the ſides of the arch are a thouſand white maſſes of marble, in the ſhape of oak trees. Mr Tournefort compares them to cauliflowers, but I ſhould as ſoon compare them to toad-ſtools. In ſhort, they are large enough to incloſe, in many places, a piece of ground big enough for a bed-chamber. One of theſe chambers has a fair white curtain, whiter than ſattin, of the ſame marble, ſtretched all over the front of it. In this we all cut our names, and the date of the year, as a great many people have done before us. In a courſe of years afterwards, the ſtone bliſters out like this white

white marble over the letters. Mr Tournefort thinks the rock grows like oaks or apple trees for this reaſon; but I remember I ſaw ſome of the fineſt cockle and muſcle ſhells, in the rock thereabouts, that ever I ſaw in my life. I wonder whether he thinks they grow there too. Beſides, if this rock grows ſo faſt, the cavern ought to be all grown up by this time; and yet, according to his meaſures and mine, the cavern ſeems on the other hand to be turned larger ſince. Indeed, all that I can gather from his account of this glorious place is, that he had drunk a bottle or two too much before he went down into it."

ANTIPAS, Herod. See HEROD.

ANTIPASCHA, in eccleſiaſtical writers, denotes the firſt Sunday after Eaſter. It is alſo called *Dominica in albis*.

ANTIPASIS, among phyſicians, revulſion.

(1.) ANTIPATER, a native of Macedon, a diſciple of Ariſtotle, and a faithful miniſter to Philip and Alexander. He was a man of great abilities, and a lover of the ſciences; but the following anecdotes ſay more for him, than any pen could ſay at this date: Philip coming rather late one day to the levee, ſaid, "I have ſlept ſound this morning, but then I knew Antipater was waking."—Some perſon having remarked to Alexander that all his officers of ſtate wore purple except this prime miniſter, "yes, (replied he,) but Antipater is all purple within." Alexander left the government of Macedon to Antipater, while he was abroad; who by his prudent conduct kept all Greece in ſubjection. On the death of his maſter, in the diviſion of territories, the European provinces were aſſigned to Antipater. Soon after the the confederate ſtates of Greece attacked him, but he ſubdued them, and completely overturned their democratic forms of government, on which he was called the father of Greece. He died A. A. C. 318, aged 80. Having choſen Polyſperchon as his ſucceſſor, his laſt advice to him was, "never to allow a woman to meddle in ſtate affairs."

(2.) ANTIPATER, a grandſon of the preceding, (N° 1.) and ſon of Caſſander, by Theſſalonice, the ſiſter of Alexander the Great; a monſter, who murdered his mother, with his own hand, becauſe ſhe favoured his brother, Alexander's claim to the crown; although ſhe begged for her life, and ſhowed him her breaſts, that had ſuckled him! See ALEXANDER V.

(3.) ANTIPATER, an Idumæan of illuſtrious birth, and poſſeſſed of great riches and abilities, taking advantage of the confuſion, into which the 2 brothers Hyrcanus and Ariſtobulus had plunged Judea by their conteſt for the office of high-prieſt, took ſuch meaſures as to gain Hyrcanus that office, and under his government to obtain the abſolute direction of all affairs; while his great abilities and application to buſineſs made him ſo conſiderable, that he was honoured as much as if he had been inveſted with the royal authority in form; but he was at laſt poiſoned by a Jew, named Malachus, 43 years before the Chriſtian æra. He left among his other children, the famous Herod king of the Jews.

(4.) ANTIPATER, Cælius, a Roman hiſtorian, who wrote a hiſtory of the Punic war, much valued by Cicero, the emperor Adrian preferred him to Salluſt.

(5.) ANTIPATER of Sidon, a ſtoic philoſopher, and poet, commended by Cicero and Seneca, who flouriſhed about the 171ſt Olympiad. Several of his epigrams are extant in the *Anthologia*.

(7.) ANTIPATER, biſhop of Boſtra, in Arabia, about the end of the 5th century. He wrote an anſwer to Euſebius's defence of Origen.

(1.) ANTIPATHES, among the ancient naturaliſts, was uſed to expreſs any ſtone or gem, which, according to their ſuperſtitious ideas of the virtues of gems at that time, was ſuppoſed to have a power of reſiſting the force of enchantments. Pliny mentions a very valuable gem, called by the ancients antipathes for this very reaſon; and the black coral had the ſame name on the ſame account.

(2.) ANTIPATHES, a ſpecies of the gorgonia, in the order of zoophytes.

* ANTIPATHETICAL. *adj.* [from *antipathy*.] Having a natural contrariety to any thing.—The ſoil is fat and luxurious, and *antipathetical* to all venomous creatures. *Howel's Vocal Foreſt.*

* ANTIPATHETICALNESS. *n. ſ.* [from *antipathetical*.] The quality or ſtate of having a natural contrariety to any thing. *Dict.*

(1.) * ANTIPATHY. *n. ſ.* [from ἀντι, againſt, and πάθος, feeling; *antipathie*, Fr.] 1. A natural contrariety to any thing, ſo as to ſhun it involuntarily; averſion; diſlike. It is oppoſed to *ſympathy*.—To this perhaps might be juſtly attributed moſt of the ſympathies and *antipathies* obſervable in men. *Locke.* 2. It has ſometimes the particle *againſt* before the object of antipathy.—I had a mortal *antipathy againſt* ſtanding armies in times of peace; becauſe I took armies to be hired by the maſter of the family, to keep his children in ſlavery. *Swift.* 3. Sometimes *to* —

Aſk you, what provocation I have had?
The ſtrong *antipathy* of good *to* bad.
When truth, or virtue, an affront endures,
Th' affront is mine, my friend, and ſhould be yours. *Pope.*

4. Formerly *with*; but improperly.—Tangible bodies have an *antipathy with* air; and any liquid body, that is more denſe, they will draw, condenſe, and, in effect, incorporate. *Bacon.*

(2.) ANTIPATHY, in ethics, hatred, averſion, repugnancy. *Hatred* is entertained againſt perſons; *averſion*, and *antipathy*, indiſcriminately againſt perſons or things; and *repugnancy*, againſt actions alone. *Hatred* is more voluntary than *averſion*, *antipathy*, or *repugnancy*. Theſe laſt have greater affinity with the animal conſtitution. The cauſes of ANTIPATHY are leſs known than thoſe of *averſion*. *Repugnancy* is leſs permanent than either the one or the other.—We hate a vicious character, we feel *averſion* to its exertions: we are affected with ANTIPATHY for certain perſons at firſt ſight; there are ſome affairs which we tranſact with *repugnancy*.—*Hatred* calumniates; *averſion* keeps us at a diſtance from certain perſons; ANTIPATHY makes us deteſt them; *repugnancy* hinders us from imitating them.

(3.) ANTIPATHY, in phyſiology, is not uſed to ſignify ſuch incompatibilities as are merely phyſi-

cal; but rather to expreſs the averſion which an animated or ſenſitive being feels at the real or ideal preſence of particular objects. In this point of view, antipathy ſignifies "a natural horror and deteſtation, an inſuperable hatred, an involuntary averſion, which a ſenſitive being feels for ſome other object, whatever it is, though the perſon who feels this abhorrence is entirely ignorant of its cauſe, and can by no means account for it." Such is, they ſay, the natural and reciprocal hoſtility between the ſalamander and the tortoiſe, between the toad and the weaſel; or between ſheep and wolves. Such is the invincible averſion of particular perſons againſt cats, mice, ſpiders, &c. a prepoſſeſſion which is ſometimes ſo violent, as to make them faint at the ſight of theſe animals. Of theſe and a thouſand other antipathies the ancient naturaliſts, the ſchoolmen, and the vulgar, form ſo many legends; and relate them as certain facts, that they may demand an explication of them from the philoſophers. But we ſhould firſt inquire whether ſuch antipathies actually exiſt or not.

(4.) ANTIPATHY, INQUIRY INTO THE REALITY OF. To explore the matter without prejudice, we find it neceſſary to abſtract from the ſubjects of this diſquiſition, 1. All ſuch antipathies as are not aſcertained; as that which is ſuppoſed to be felt by hens at the ſound of an harp whoſe ſtrings are made of a fox's bowels, between the ſalamander and tortoiſe, and between the weaſel and the toad. Nothing is leſs confirmed, or rather nothing is more falſe, than theſe ſtories with which vulgar credulity and aſtoniſhment are amuſed and actuated: and though ſome of theſe antipathies ſhould be aſcertained, this would be no proof that the animals which feel them are not acquainted with their cauſes, according to their mode and proportion of knowledge; in which caſe it will be no longer the antipathy which we have defined. 2. We muſt abſtract thoſe antipathies which can be extinguiſhed or reſumed at pleaſure; thoſe fictitious averſions, which certain perſons feel, or pretend to feel, with affected airs, that they may appear more preciſe and finical, or ſingularly and prodigiouſly elegant; that they may ſeem to have ſenſibilities ſo exquiſitely fine, as require to be treated with peculiar delicacy. One who beſtows any attention on the ſubject, would be aſtoniſhed to find how many of theſe chimerical averſions there are, which are pretended, and paſſed upon the world by thoſe who affect them as natural and invincible. 3. When we abſtract thoſe averſions the cauſes of which are known and evident; we ſhall be ſurpriſed, after our deduction of theſe pretended antipathies from the general ſum, how ſmall, how inconſiderable, is the quantity of thoſe which are conformable to our definition. Will any one call by the name of *antipathy*, thoſe real, innate, and inconteſtible averſions which prevail between ſheep and wolves? Their cauſe is obvious: the wolf devours the ſheep, and ſubſiſts upon his victims: and every animal naturally flies with terror from pain and deſtruction: ſheep therefore regard wolves with horror. Beſides, this averſion is improperly ſtiled *reciprocal*; for it only takes place on the part of the ſheep. The wolf, inſtead of *antipathy* or *averſion*, feels an irreſiſtible deſire, (or *fondneſs* ſo to ſpeak,) for mutton.

(5.) ANTIPATHY, PRINCIPAL CAUSES OF. From principles ſimilar to thoſe of the averſion entertained by ſheep againſt wolves, ariſes that averſion which numbers of people feel againſt ſerpents; againſt reptiles in general, and the greateſt number of inſects. During the credulous and ſuſceptible period of infancy, pains have been taken to impreſs on our minds the frightful idea that they are venemous; that their bite is mortal; that their ſting is dangerous, productive of tormenting inflammations, and ſometimes of death: they have been repreſented to us as ugly, and pernicious to thoſe who touch them; as poiſoning thoſe who have the misfortune to ſwallow them; or as living and multiplying within them. Theſe horrible prepoſſeſſions are induſtriouſly inculcated from infancy; they are ſometimes attended and ſupported by diſmal tales, which are greedily imbibed, and indelibly engrayen on our memories. It has been taught us both by precept and example, when others at their approach have aſſumed in our view the appearance of deteſtation and even of terror, that we ſhould fly from them. Is it then wonderful, (if our falſe impreſſions as to this ſubject have been corrected neither by future reflections nor experiments,) that we ſhould entertain, during our whole lives, an averſion for theſe objects, even when we have forgot the admonitions, the converſations, and examples, which have taught us to believe and apprehend them as noxious beings? In proportion to the ſenſibility of our frame, in proportion as our nerves are irritable, our emotions at the ſight of what we fear will be more violent, eſpecially if they anticipate our expectation, and ſeize us unprepared, though our ideas of what we have to fear from them are the moſt confuſed and indiſtinct imaginable. To explain theſe facts, it is by no means neceſſary to fly to the exploded ſubterfuge of occult qualities inherent in bodies, to latent relations productive of antipathies, of which no perſon could ever form an idea. It is often ſufficient to influence a perſon who had formerly no averſion for an object, if he lives with ſome other aſſociate who gives himſelf up to ſuch capricious panics; the habit is inſenſibly contracted to be agitated with diſagreeable emotions at the preſence of an object which had been formerly beheld with indifference and cold blood. "I was acquainted (ſays the author of the article ANTIPATHIE in the French Encyclopedie) with a perſon of a very ſound underſtanding, whom thunder and lightning by no means terrified, nay, to whom the ſpectacle appeared magnificent and the ſound majeſtic; yet to a mind thus ſeemingly fortified againſt the infectious terror, no more was neceſſary than ſpending the ſummer with a friend in whom the appearance of lightning excited the ſtrongeſt emotions, and whom the remoteſt clap of thunder affected with extravagant paroxyſms, to become timid in exceſs at the approach of thunder: nor could he ever afterwards ſurmount the fear which it inſpired." The frightful ſtories of dogs and cats, which have killed their maſter, or who have given them mortal wounds, are more than ſufficient to inſpire a timid

morous perſon with averſion againſt theſe animals; and if the olfactory nerves of ſuch a perſon be delicate, he will immediately diſcover the ſmell of them in a chamber: diſturbed by the apprehenſion which theſe effluvia excite in his mind, he gives himſelf up to the moſt violent uneaſineſs, which is tranquillized when he is aſſured that the animal is no longer in the room. If by chance, in the ſearch which is made to calm the uneaſineſs of this timorous perſon, one of theſe creatures ſhould be at laſt diſcovered, every one preſently exclaims, *A miracle!* and admits the reality of *antipathies* into his creed; whilſt all this is nothing but the effect of a childiſh fear, founded on certain confuſed and exaggerated ideas of the hazard which one may run with theſe animals. The antipathy which ſome people entertain againſt eels, though they are eaten by others with pleaſure, ariſes from nothing but the fear of ſerpents, to which theſe fiſhes are in ſome degree ſimilar. There are likewiſe other antipathies which do not originate in the imagination, but ariſe from ſome natural incongruity or infirmity; ſuch as we often remark in children, for particular kinds of victuals, with which their taſte is not offended, but which their ſtomachs cannot digeſt, and which are therefore diſgorged as ſoon as ſwallowed. In ſhort, all thoſe antipathies, of which we have heard ſo much, may be reduced, either, 1. to legendary tales; or 2. to averſions againſt objects which we believe dangerous; or 3. to a childiſh terror or imaginary perils; or 4. to a diſreliſh, of which the cauſe is diſguiſed; or 5. to a ridiculous affectation of delicacy; or 6. to an infirmity of the ſtomach; in a word, to a real or pretended reluctance for things which are either inveſted, or ſuppoſed to be inveſted, with qualities hurtful to us. Too much care, therefore, cannot be taken to prevent, or regulate, the antipathies of children; to familiariſe them with objects of every kind; to diſcover to them, without emotion, ſuch as are dangerous; to teach them the means of defence and ſecurity, of the methods of eſcaping their noxious influence; and, when the rational powers are matured by age, to reflect on the nature of thoſe objects which we fear, to aſcertain what has been told concerning their qualities, or vigorouſly to exert our own reſolution to overcome thoſe vain repugnancies which we may feel. See SYMPATHY, which is the oppoſite of *Antipathy*.

ANTIPATRIS, a town of Paleſtine, anciently called Caphar Saba, according to Joſephus, but named Antipatris, by Herod the Great, in honour of his father Antipater. It was ſituated in a pleaſant valley, near the mountains, in the road from Jeruſalem to Cæſarea: 42 miles from the former, 26 from the latter; and 17 from Joppa, according to Joſephus. The apoſtle Paul, and his guard, ſtopt at this place, on their way to Cæſarea. Acts xxiii. 31.

ANTIPELARGIA, among the ancients, a law, whereby children are obliged to furniſh neceſſaries to their aged parents. The ciconia, or ſtork, is a bird famous for the care it takes of its parents when grown old. Hence, in ſome Latin writers, this is rendered *lex ciconiaria*, or the ſtorks law. Paſſavant publiſhed a diſſertation De Antipelargia, Baſil, 1672. 4to.

ANTIPERISTALTIC, [from ἀντὶ, againſt, περὶ, about, and στάλλω, that which has the power of compreſſing,] in anatomy, a motion of the inteſtines, contrary to the *periſtaltic* motion. As the periſtaltic motion is a contraction of the fibres of two inteſtines from above, downwards; the antiperiſtaltic motion is their contraction from below, upwards. Phyſicians, ancient as well as modern, have uſually had recourſe to the notion of an antiperiſtaltic motion, to account for the action of vomiting, and the phænomena of the iliac paſſion. The cauſe of the antiperſtaltic motion is uſually aſſigned to be a ſtoppage of ſome of the inteſtines, but chiefly of the ilium. Mr Littre urges many arguments in favour of this doctrine; but ſome late ingenious authors have overturned the whole antiperiſtaltic ſyſtem, and ſhewn this motion imaginary, as well as unneceſſary for accounting for theſe diſorders. Meſſ. Chirac and du Verney have endeavoured to prove this in reſpect of vomiting; Meſſ. Haguent and St Andre, in the iliac paſſion.

* ANTIPERISTASIS. *n. ſ.* [from ἀντιπερίστασις, formed of ἀντὶ, and περίστημι, to ſtand round.] The oppoſition of the contrary quality, by which the quality it oppoſes becomes heightened or intended; or the action, by which a body attacked by another, collects itſelf, and becomes ſtronger by the oppoſition of another. This quicklime is ſet on fire, by the affuſion of cold water; ſo water becomes warmer in winter than in ſummer; and thunder and lightening are excited in the middle region of the air, which is continually cold, and all by *antiperiſtaſis*. This is an exploded principle in the peripatetic philoſophy.—

Th' *antiperiſtaſis* of age
More inflam'd his am'rous rage. *Cowley.*

—The riotous prodigal deteſts covetouſneſs; yet let him find the ſprings grow dry; which feeds his luxury, covetouſneſs ſhall be called in; and ſo, by a ſtrange *antiperiſtaſis*, prodigality ſhall, beget rapine. *Decay of Piety.*

* ANTIPESTILENTIAL. *adj.* [from ἀντὶ, againſt, and *peſtilential*.] Efficacious againſt the infection of the plague.—Perfumes correct the air before it is attracted by the lungs; or, rather, *antipeſtilential* unguents, to anoint the noſtrils with. *Harvey on the Plague.*

ANTIPHARMACUM, [from ἀντὶ, and φάρμακον, poiſon, a remedy againſt poiſon.

ANTIPHERNA, among the ancient Greeks, denoted a kind of ſettlement made on a wife in caſe of ſurviving her huſband, as an equivalent for her dowry. This word ſeems to anſwer what in our law is called a jointure.

ANTIPHILUS, a famous painter, and the rival of Apelles. He is celebrated for many fine pictures, but moſt of all for one, repreſenting a youth blowing a ſpark of fire; from which it would appear that the ancients were not ignorant of the magical effects of the chiaro obſcuro.

ANTIPHLOGISTIC, [from ἀντὶ, and φλογίζω, to inflame,] againſt inflammation; cooling.

ANTIPHON, the Rhamnuſian, an Athenian orator. He flouriſhed about the year 430 A. A. C. and is ſaid to have been the firſt who laid down rules of oratory. It is alſo ſaid he was concerned in eſtabliſhing the tyranny of the four hundred, and that on this account he was put to death,

A. A. C.

A. A. C. 411. In the collection of ancient orators there are fixteen orations under his name.

ANTIPHONA, or ANTIPHONE, the anſwer made by one choir to another. See ANTIPHONARY, and ANTIPHONY.

ANTIPHONALLY, [from ἀντὶ, and φωνὴ, voice,] in reſpect of church muſic, imports as much as alternately, or anthem wiſe. The Greeks have a method of ſinging *antiphonally*, *antiphonatim*, called by them ἀντιφωνητὶ, wherein two perſons ſing together, and then are ſilent, and ſucceeded by two others, who ſing a while, and then are ſilent, and ſo on.

ANTIPHONARIUM, } a ſervice book, which
ANTIPHONARY, } contained all the invitatories, reſponſaries, collects, and whatever elſe was ſung or ſaid in the choir, except the leſſons. This is otherwiſe called *reſponſarium*, from the reſponſes therein contained. The author of the Roman *antiphonary* was pope Gregory the Great. We alſo find mention of nocturnal and diurnal *antiphonaries*, for the uſe of the daily and nightly offices; ſummer and winter *antiphonaries*; alſo *antiphonaries* for country churches, &c. By the provincial conſtitutions of archbiſhop Winchelſey, made at Merton, A. D. 1305, it is required that one of theſe ſhould be found in every church within the province of Canterbury. Theſe and many other popiſh books were forbid to be uſed, by the 3d and 4th of Edward, VI. c. 10.

ANTIPHONERE, a book of anthems. *Chauc.*

ANTIPHONY, the anſwer made by one choir to another, when the pſalm or anthem is ſung between two. The word ſometimes denotes a ſpecies of pſalmody, where in the congregation, being divided into parts, repeat the pſalms, verſe for verſe, alternately. In this ſenſe, antiphony differs from ſymphony, where the whole congregation ſings together. It alſo differs from reſponſarium wherein the verſe is only ſpoken by one perſon, whereas in the former, the verſes are ſung by the two choirs alternately. The original of antiphonal ſinging, in the weſtern churches, is referred to the time of St Ambroſe, who, about the year 374, is ſaid to have firſt introduced it into the church of Milan, in imitation of the eaſtern church, where it appears to be of greater antiquity; though, as to the time of its inſtitution, authors are not agreed; it was moſt probably introduced at Antioch, between the years 347 and 356. Antiphony alſo denotes the words given out at the beginning of the pſalm, to which both the choirs accomodate their ſinging. It ſignifies in a modern ſenſe, a kind of compoſition made of ſeveral verſes extracted out of different pſalms, adapted to expreſs the myſtery ſolemnized on this occaſion.

(1.) * ANTIPHRASIS. *n. ſ.* [from ἀντὶ, againſt, and φάσις, a form of ſpeech. The uſe of words in a ſenſe oppoſite to their proper meaning.—You now find no cauſe to repent, that you never dipt your hands in the bloody high courts of juſtice, ſo called only by *antiphraſis*. *South.*

(2.) ANTIPHRASIS, is defined by Sanctius, to be a form of irony, whereby we ſay a thing, by denying what we ought rather to affirm it to be: as when we ſay, *it did not diſpleaſe me*; or *he is no fool*; meaning, *I was pleaſed with it*; or, *he is a man of ſenſe*. On this principles, the antiphraſes ought to be ranked among the figures of ſentences, and not among thoſe of words. It is a common error, to make antiphraſes conſiſt in ſingle words; as when we ſay, that the Parcæ are thus called by antiphraſes, becauſe they ſpare nobody, *Parcæ, qui nemini parcunt*. St Jerom, in his epiſtle to Riparius againſt Vigilantius, ſays, he ought rather to be called *Dormitantius per antiphraſin*, than Vigilantius, becauſe he oppoſed the Chriſtians holding wakes at the tombs of the martyrs. Sanctius holds it improper to call theſe antiphraſes: becauſe phraſis is not applicable to a ſingle word, but ſignifies *orationem*, *loquendi modum*.

ANTIPHTHISICA, [from ἀντὶ, and φθίσις, corruption,] medicines againſt conſumption.

ANTIPLEURITICS, medicines againſt the pleuriſy.

ANTIPODAGRICS, [from ἀντὶ, and ποδάγρα, the gout,] remedies for the gout.

* ANTIPODAL. *adj.* [from *antipodes*.] Relating to the countries inhabited by the antipodes.—The Americans are *antipodal* unto the Indians. *Brown.*

(1.) * ANTIPODES. *n. ſ.* *It has no ſingular.* [from ἀντὶ, againſt, and πόδες, feet.] Thoſe people who, living on the other ſide of the globe, have the feet directly oppoſite to ours.—

We ſhould hold day with the *antipodes*,
If you would walk in abſence of the ſun. *Shak.*

(2.) ANTIPODES, FARTHER DEFINITION OF. Antipodes lie under oppoſite meridians, and oppoſite parallels; in the ſame degree of latitude, but of oppoſite denominations, one being north, and the other ſouth. They have nearly the ſame degree of heat and cold, days and nights of equal length, but in oppoſite ſeaſons. It is noon to one, when midnight to the other; and the longeſt day with the one, is the ſhorteſt with the other.

(3.) ANTIPODES, OPINIONS OF THE ANCIENTS RESPECTING. Plato is eſteemed the firſt who thought it poſſible that antipodes exiſted, and is looked upon as the inventor of the word. As this philoſopher apprehended the earth to be ſpherical, he had only one ſtep to make, to conclude the exiſtence of antipodes. The ancients in general, treated this opinion with the higheſt contempt. Lactantius and Auguſtine, laughed at the notion of antipodes. The latter of theſe fathers is ſtrangely perplexed to think, how men and trees ſhould hang pendulous in the air, with their feet uppermoſt, as he thought they muſt do in the other hemiſphere! And Boniface, archbiſhop of Mentz, and legate of pope Zachary in the 8th century, declared a biſhop of that time, called Vigilius, a *heretic*, for maintaining that there were ſuch beings as antipodes. But the Chriſtian fathers were not the only perſons who diſputed the truth of the antipodes. Lucretius had done it before them, at the end of his firſt book, v. 1063, &c. See alſo Plutarch, lib. *De facie in orbe lunæ*; and Pliny, who refutes the opinion, lib. ii. cap. 5. They never reflected that theſe terms *upwards* and *downwards* are merely relative; and ſignify only nearer to, or farther from, the centre of the earth, the common centre, to which all heavy bodies gravitate; and that, therefore, our antipodes have not their

feet upwards, and head downwards, any more than ourſelves; for they, as well as we, have their feet nearer the centre of the earth, and their heads farther from it. To have the head downwards, and feet upwards, is to place the body in a direction of gravity, tending from the feet to the head: but this cannot be ſuppoſed with regard to the antipodes; for they, as well as we, tend toward the centre of the earth, in a direction from head to foot.

ANTIPODIA, in poetry, a figure by which one foot is changed for another, if both be of equal meaſure.

ANTIPOLIS, in ancient geography, a colony of the Maſſilians, near the river Verus, in Gallia Narbonenſis. It is now called ANTIBES, which ſee.

(1.) * ANTIPOPE. *n. ſ.* [from ἀντι, againſt, and pope.] He that uſurps the popedom, in oppoſition to the right pope.—This houſe is famous in hiſtory, for the retreat of an *antipope*, who called himſelf Felix V. *Addiſon.*

(2.) ANTIPOPES. Geddes gives the hiſtory of no leſs than 24 ſchiſms in the Romiſh church, cauſed by antipopes; ſome took their riſe from a diverſity of doctrine of belief, which led different parties to elect each their ſeveral pope; but the greater part from dubious controverted rights of election, the fruits of chicane and ambition.

ANTIPORTICO, a veſtibule, or porch, at the entrance of an edifice.

ANTIPRAXIA, [from ἀντι, and πρᾶττω, I perform,] in the ancient phyſic, denotes a contrariety of functions, temperaments, &c. in different parts of the body; invented to account for that contrariety of ſymptoms which frequently concur in hypochondriac caſes; when, *e. g.* the liver is ſaid to be immoderately hot, and the ſtomach exceſſively cold. The moderns, particularly Etmuller, refute the notion of an antipraxia, on this principle, that the blood circulating duly through the whole body, warms all the parts, as well the ſtomach as liver proportionably. To which ſome advocates for the ancient ſyſtem object, that this confounding the preternatural ſtate with the natural.

ANTIPREDICAMENTS. See ANTEPREDICAMENT.

ANTIPROBABILISM, the doctrine of thoſe who hold it unlawful to follow the leſs probable opinion in oppoſition to the more probable one. There have been vigorous advocates for *antiprobabilism*; for even among its greateſt enemies, the Jeſuit F. Gilbert has a treatiſe expreſsly in favour of *antiprobabiliſm*, viz. ANTIPROBABILISMUS, *ſeu ſtatus theologicus fidelem, totius probabiliſmi ſtatum continens*, &c. Par. 1703. 4to.

ANTIPROBOLE, in rhetoric, a figure wherein the defendant adopts or admits the charge brought againſt him by the proſecutor: *e. g.* ſuppoſing the proſecutor's προβολὴ to be, *Titus has killed Caius*; the defendant's *antiprobole* may be, *I have killed him, but undeſignedly.*

ANTIPROPEMPTICON, in poetry, a poem wherein a perſon going a journey addreſſes himſelf to his friends. Such is that of Ovid, lib. i. Trift.—

Cum ſubit illius triſtiſſima noctis imago, &c.

ANTIPROTASIS, in rhetoric, a ſolution of the PROTASIS.

ANTIPSORA, [from ἀντι, and ψώρα, itch,] in pharmacy, remedies againſt the itch.

* ANTIPTOSIS. *n. ſ.* [ἀντίπτωσις.] A figure in grammar, by which one caſe is put for another.

ANTIPYRETON, [from ἀντι, and πῦρ, fire,] among phyſicians, an appellation given to the medicines againſt fevers.

ANTIQUARE, among Roman lawyers, the rejecting of a new law, or refuſing to paſs it; in which ſenſe, *antiquating* differs from *abrogating*; as the latter imports the annulling an old law. See A. *Antiquare* is alſo uſed for a law growing obſolete, either by age or non-obſervance.

(1.) ANTIQUARIES, perſons who ſearch after and collect, all relicts of antiquity, ſuch as old books, coins, medals, ſtatues, ſculptures, inſcriptions, and every thing that tends to throw light on ancient hiſtory. See ANTIQUARY, N° 2 and 3. In the chief cities of Greece and Italy, there were perſons of diſtinction called *antiquaries*, whoſe buſineſs it was to ſhow ſtrangers the antiquities of the place, to explain the ancient inſcriptions, and to give them all the aſſiſtance they could in this way of learning.—Pauſanias calls theſe antiquaries Ἐξηγηταὶ. The Sicilians call them *myſtogogi*. There was an ancient college of antiquaries erected in Ireland by Ollahm Fodhla, 700 years before Chriſt, for compoſing a hiſtory of that country: And to this, ſay the Iriſh hiſtorians, it is owing that the hiſtory and antiquities of that kingdom may be traced back beyond thoſe of moſt other nations. There is a ſociety of antiquaries in London, and another in Edinburgh, incorporated by Royal charter. The London Society of Antiquaries was inſtituted in 1751. Every member pays five guineas at his admiſſion, and two guineas annually thereafter; or an additional ſum of twenty-one guineas. They meet weekly on Thurſday evening, at their rooms in Somerſet-houſe. See farther under the article SOCIETY.

(2.) ANTIQUARIES, SCOTS, THE SOCIETY OF. See SOCIETY.

ANTIQUARII, a name given to copiers of old books. After the decline of learning among the Romans, and when many religious houſes were erected, learning was chiefly in the hands of the clergy; the greateſt numbers of whom were regulars, and lived in monaſteries. Some of theſe were induſtrious men, who were continually employed in making new copies of old books, either for the uſe of the monaſtery or for their own emolument. Theſe writing monks were called *Antiquarii*. They deprived the poor librarii, or common ſcriptores, of great part of their buſineſs, ſo that theſe found it difficult to gain a ſubſiſtence for themſelves and families. This put them upon finding out more expeditious methods of tranſcribing books. They formed the letters ſmaller, and made uſe of more jugations and abbreviations than had been uſual. They proceeded in this manner till the letters became exceedingly ſmall; the abbreviations very numerous, and extremely difficult to be read. This in ſome meaſure accounts for the great variety of hands in the ſpecies of writing called *Modern Gothic*. When a number of copies were to be made of the ſame work, it

was

was uſual to employ ſeveral perſons at the ſame time in writing it; each perſon, except him who wrote the firſt ſkin, began where his fellow was to leave off.

ANTIQUARIUM, among the ancients, denoted a place or apartment, wherein their antique monuments were preſerved.

ANTIQUARTAN, a medicine preſcribed by Riverius, againſt the quartan ague. It is a preparation of *mercurius dulcis*, *aurum fulminans*, ſulphur of antimony, and ſcammony.

ANTIQUARTANARIUM, [from *anti*, and *quartanarius*, Lat.] a remedy for the quartan ague.

ANTIQUARTIUM, a name uſed by ſome modern practitioners, for a ſpecific againſt the quartan ague. Wedelius alſo ſpeaks of an *eſſentia antiquartia*.

ANTIQUARTIUM PERUVIANUM, Jeſuits bark.

* ANTIQUARY, *adj.* [This word is improper.] Old; antique.—

Here's Neſtor,
Inſtructed by the *antiquary* times;
He muſt, he is, he cannot but be wiſe. *Shak.*

(2.) * ANTIQUARY. *n. ſ.* [*antiquarius*, Lat.] A man ſtudious of antiquity; a collector of ancient things.—All arts, rarities, and inventions, are but the relicts of an intellect defaced with ſin. We admire it now, only as *antiquaries* do a piece of old coin, for the ſtamp it once bore. *South.*

(3.) ANTIQUARY is alſo uſed by ancient writers for the keeper of the antiquarium or cabinet of antiquities, who is likewiſe called *archæota* or antiquary of a king, a prince, a ſtate, or the like. Henry VIII. gave John Leland the title of his *antiquary*; a title which, ſays the author of his life, no body ever enjoyed beſides himſelf. But the reſtriction, we ſuppoſe, was only intended to be underſtood in reſpect of the kings of England. M. Schott, we find, had the title of *antiquary* to the king of Pruſſia; P. Pedruzzi, that of *antiquary* of the Duke of Parma; M. Galland reſided ſometime in Turkey under the title of *antiquary* of the king of France.—The univerſity of Oxford have ſtill their antiquary under the denomination of *cuſtus archivorum*.—The kings of Sweden have been at great expences in order to illuſtrate the antiquity of their country, having eſtabliſhed an academy of antiquaries with this ſingle view.—The office of the ancient Iriſh antiquaries was to preſerve the genealogies of the kings of Ireland, to correct the regal tables of ſucceſſion, and deliver down the pedigree of every collateral branch of the royal family. See ANTIQUARIES, N° 1.

* *To* ANTIQUATE. *v. a.* [*antiquo*, Lat.] To put out of uſe; to make obſolete.—The growth of Chriſtianity in this kingdom might reaſonably introduce new laws, and *antiquate* or abrogate ſome old ones, that ſeemed leſs conſiſtent with the Chriſtian doctrines. *Hale's Common Law of Engl.*

ANTIQUATED; obſolete; out of date; or out of uſe.

* ANTIQUATEDNESS. *n. ſ.* [from *antiquated*.] The ſtate of being antiquated, worn out of uſe, or obſolete.

ANTIQUATION. Abrogation, or leaving off the uſe of any thing. *Bailey.*

(1.) * ANTIQUE. *adj.* [*antique*, Fr. *antiquus*, Lat.] It was formerly pronounced according to the Engliſh analogy, with the accent on the firſt ſyllable; but now after the French, with the accent on the laſt, at leaſt in proſe; the poets uſe it variouſly.] 1. Ancient; old; not modern.—

Now good Ceſario, but that piece of ſong,
That old and *antique* ſong we heard laſt night.
Shakeſpeare.

2. Of genuine antiquity.—The ſeals which we have remaining of Julius Cæſar, which we know to be *antique*, have the ſtar of Venus over them. *Dryden.* 3. Of old faſhion.—

Muſt he no more divert the tedious day?
Nor ſparkling thoughts in *antique* words convey? *Smith to the Memory of Philip.*

3. Odd; wild; antick;—

Name not theſe living death-heads unto me;
For theſe not ancient but *antique* be. *Donne.*

(2.) * ANTIQUE. *n. ſ.* [from *antique*, *adj.*] An antiquity; a remain of ancient times; an ancient rarity.—I leave to Edward, now earl of Oxford, my ſeal of Julius Cæſar; as alſo another ſeal, ſuppoſed to be a young Hercules; both very choice *antiques*, and ſet in gold. *Swift.*

(3.) ANTIQUE is chiefly uſed among architects, ſculptors, and painters; who apply it to ſuch pieces of buildings, ſculpture, painting, &c. as were made at the time when the arts were in their greateſt perfection, among the ancient Greeks and Romans; viz. from the age of Alexander to the time of the emperor Phocas, about A. D. 600, when Italy was over-run by the Goths and Vandals. In this ſenſe the word ſtands oppoſed to *modern*. Thus we ſay, an antique building, or a building after the antique; an antique buſt, or bas-relievo; the antique manner, taſte, &c. Antique is alſo contra-diſtinguiſhed from *ancient*, which denotes the leſſer degree of antiquity, when the art was not in its utmoſt purity. Thus *antique* architecture is frequently diſtinguiſhed from *ancient* architecture.

* ANTIQUENESS. *n. ſ.* [from *antique*.] The quality of being antique; an appearance of antiquity.—We may diſcover ſomething venerable in the *antiqueneſs* of the work; but we would ſee the deſign enlarged. *Addiſon.*

(1.) ANTIQUITIES, a term implying all teſtimonies, or authentic accounts, that have come down to us of ancient nations. Bacon calls antiquities *the wrecks of hiſtory*, or ſuch particulars as induſtrious and learned perſons have collected from genealogies, inſcriptions, monuments, coins, names, etymologies, archives, inſtruments, fragments of hiſtory, &c. The ſtudy of antiquities forms a very extenſive ſcience, or rather comprehends a general acquaintance with all the ſciences, as including an hiſtorical knowledge of the edifices, magiſtrates, offices, habiliments, manners, cuſtoms, ceremonies, worſhip, and other objects worthy of curioſity, of all the principal ancient nations of the earth.

(2.) ANTIQUITIES, ADVANTAGES OF THE STUDY OF. This ſcience is not a matter of mere curioſity, but is indiſpenſable to the theologian who ought to be thoroughly acquainted with the antiquities of the Jews, to enable him properly to explain numberleſs paſſages in the Old and New Teſta-

Teſtaments: to the lawyer; who, without the knowledge of the antiquities of Greece and Rome, can never well underſtand, and properly apply, the greateſt part of the Roman laws: to the phyſician and the philoſopher, that they may have a complete knowledge of the hiſtory and principles of the phyſic and philoſophy of the ancients: to the critic that he may be able to underſtand and interpret ancient authors: to the orator and poet; who will be thereby enabled to ornament their writings with numberleſs images, illuſions, compariſons, &c. Antiquities are divided into ſacred and profane, into public and private, univerſal and particular, &c. It is true, that the antiquaries eſpecially ſuch as are infected with a ſpirit of pedantry, and the number of theſe is great frequently carry their inquiries too far, and employ themſelves in laborious reſearches after learned trifles: but the abuſe of a ſcience ought never to make us neglect the applying it to rational and uſeful purpoſes. Many antiquaries alſo reſtrain their learned labours to the eclairciſſement of the antiquities of Greece and Rome: but this field is far too confined, and by no means contains the whole of this ſcience, ſeeing it probably includes the antiquities of the Jews, Egyptians, Perſians, Phenicians, Carthaginians, Hetruſcans, Germans, and, in general, all thoſe principal nations mentioned in ancient hiſtory: ſo far as any accounts of them are come down to us. If to the general ſubjects abovementioned we add the particular ſtudy of antiques, of the ſtatues, baſſ-reliefs, and the precious relics of architecture, paintings, camayeus, medals, &c. it is eaſy to conceive that antiquities form a ſcience very extenſive, and very complicated, and with which only a very ſmall acquaintance could have been attainable by any one man, if our predeceſſors had not prepared the way for us; if they had not left us ſuch ineſtimable works as thoſe of Gronovius, Graevius, Montfaucon, Count Caylus, Winckleman, the Hebraic antiquities of D. Iken of Bremen, the Grecian antiquities of Brunings, the Roman antiquities of Nieupoort, and eſpecially profeſſor John Albert Fabricius's *Bibliographia Antiquaria*, &c. &c. Nor muſt we here forget that very valuable work, with which our countryman Mr Robert Wood has lately enriched this ſcience, and which is ſo well known, and ſo juſtly eſteemed by all true connoiſſeurs, under the title of the *Ruins of Palmyra*, and thoſe of *Balbeck*. It is by this work that we are fully convinced of the grandeur and magnificence, the taſte and elegance, of the buildings of the ancients. We here ſee that the invention of theſe matters is not all owing to the Greeks, but that there were other nations who ſerved them as models. For, though many of the edifices of Palmyra are to be attributed to the emperor Aurelian, and to Odenatus and his wife Zenobia, who reigned there about the year 264, yet there are found, at the ſame place, ruins of buildings, that appear to be of far greater antiquity, and that are not leſs beautiful. The ancient Perſepolis is ſufficient to prove this aſſertion. When we duly reflect on all theſe matters, and eſpecially if we attempt to acquire any knowledge of this ſcience, we ſhall ſoon be convinced, that it ill becomes a petit-maitre to laugh at a learned antiquary. The knowledge of thoſe monuments of the ancients, the works of ſculpture, ſtatuary, graving, painting, &c. which they call *antiques*, requires a ſtrict attention, with regard to the matter itſelf on which the art has been exerciſed; as the wax, clay, wood, ivory, ſtones of every kind, marble, flint, bronze, and every ſort of metal. We ſhould begin by learning on what matter each ancient nation principally worked, and in which of the fine arts they excelled. For the matter itſelf, as the different ſorts of marble, compoſitions of metals, and the ſpecies of precious ſtones, ſerve frequently to characterize the true antique, and to diſcover the counterfeit. The connoiſſeurs pretend alſo to know, by certain diſtinct characters in the deſign and execution of a work of art, the age and nation where it was made. They find, moreover, in the invention, and execution, a degree of excellence, which modern artiſts are not able to imitate. Now, though we ought to allow, in general, the great merit of the ancients in the polite arts, we ſhould not, however, ſuffer our admiration to lead us into a blind ſuperſtition. There are pieces of antiquity of every ſort, which have come down to us, ſome that are perfectly excellent; and others ſo wretched, that the meaneſt among modern artiſts would not acknowledge them. The mixture of the good and bad has taken place in all ſubjects, at all times, and in all nations. The misfortune is, that moſt of our great antiquaries have been ſo little ſkilled in deſigning, as ſcarcely to know how to draw a circle with a pair of compaſſes. It is prejudice, therefore, which frequently directs them to give the palm to the ancients, rather than a judgment directed by a knowledge of the art. That character of expreſſion, which they find ſo marvellous in the works of antiquity, is often nothing more than a mere chimera. They pretend that the artiſts of our days conſtantly exaggerate their expreſſions; that a modern Bacchus has the appearance of a man diſtracted with intoxication; that a Mercury ſeems to be animated with the ſpirit of a fury; and ſo of the reſt. But let them not decide too haſtily. Almoſt all the antique figures are totally void of all ſpirit of expreſſion; we are forced to gueſs at their characters. Every artificial expreſſion requires, moreover, to be ſomewhat exaggerated. A ſtatue or portrait is an inanimate figure; and muſt therefore have a very different effect from one which, being endowed with life, has the muſcles conſtantly in play, and where the continual change of the features, the motion of the eyes, and the looks, more or leſs lively, eaſily and clearly expreſs the paſſions and ſentiments. Whereas, in a figure that is the produce of art, the delicate touches that ſhould expreſs the paſſions, are loſt to the eyes of the ſpectators: they muſt therefore be ſtruck by ſtrong, bold characters, which can affect them at the firſt glance of the eye. A very moderate artiſt is ſenſible, at the ſame time, that he is not to give his figures extravagant expreſſions, nor to place them in diſtorted attitudes.

(1.) * ANTIQUITY. *n. ſ.* [*antiquitas*, Lat.] 1. Old times; time paſt long ago.—I mention Ariſtotle, Polybius, and Cicero, the greateſt philoſopher, the moſt impartial hiſtorian, and the moſt conſummate ſtateſman of all *antiquity*. *Addiſon.*

2. The people of old times; the ancients.—That ſuch pillars were raiſed by Seth, all *antiquity* has avowed. *Raleigh.* 3. The works or remains of old times.—As for the obſervation of Machiavel, traducing Gregory the Great, that he did what in him lay, to extinguiſh all heathen *Antiquities:* I do not find that thoſe zeals laſt long; as it appeared in the ſucceſſion of Sabinian, who did revive the former *antiquities*. *Bacon.* 4. Old age; a ludicrous ſenſe.—Is not your voice broken? your wind ſhort? your chin double? your wit ſingle? and every part about you blaſted with *antiquity?* and will you yet call yourſelf young? *Shakeſpeare.* 5. Ancientneſs; as, this ring is valuable for its *antiquity*.

(2.) ANTIQUITY, EXTRAVAGANT CLAIMS OF NATIONS TO. There is ſcarce a nation under heaven but lays claim to a greater degree of antiquity than the reſt of its neighbours: The Scythians, the Phrygians, the Chaldeans, Egyptians, Greeks, Chineſe, &c. pretend each to have the honour of being the firſt inhabitants of the earth; ſeveral of theſe nations, leſt they ſhould be outſtripped in their pretenſions by any of the reſt, have traced up their origin to ages long before the received account of the creation. Hence the appellations *aborigines, indigenæ, terrigenæ, antelunares*, &c. The Athenians pretended to be *autochthones;* and what is remarkable, Socrates himſelf gave them this ridiculous appellation; which, as ſome other philoſophers juſtly obſerved, only put them on a level with ants and graſhoppers. The Chaldeans pretend to aſtronomical obſervations of 470,000, or 473,000 years; they mention the preciſe king who reigned over them at the time of the deluge, whoſe name was Xiſuthrus, and attribute to him ſeveral things which we aſcribe to Noah, (See ANTIDILUVIANS, § 8.) The Chaldaic antiquities of Berofus are loſt, except a few fragments which have been collected by Joſeph Scaliger, and ſince more fully by Fabricius. St Auguſtine laughs at the folly of the Egyptians who pretend to obſervations of the ſtars above 100,000 years old; in effect, no people appear to have been warmer in the conteſt for antiquity than thoſe of Egypt. They pretend two periods of time; one ſhorter, during which the throne of Egypt had been filled by men, the other almoſt infinite, wherein gods and demi-gods had wore the crown. From Iſis and Oſiris to Alexander they reckoned a ſpace of 23000 years, the time before that, while the gods reigned, made 42984 years more; the whole duration from the beginning of the monarchy amounting to 65984. The computation of their dynaſties as given by Manetho, extends to 5550 years before Alexander's time; and the Egyptian chronicle, cited by Syncellus, goes farther, reckoning 36,525 years! Diogenes Laertius makes no leſs than 48,863 years from the reign of Vulcan! Yet the Scythians, the Phrygians, the Ethiopians, and ſome others, ſtill inſiſted on their *priority* to the Egyptians. It is no wonder that their catalogues ſhould be ridiculouſly incredible, when the Egyptians made their firſt kings reign 1200 years a-piece, and the Aſſyrians theirs about 4000! But the Chineſe pretend to be the moſt ancient monarchy in the univerſe; having cultivated the ſciences from the earlieſt ages, and ſubſiſted at leaſt theſe 4000 years, with the ſame laws, manners and uſages! Some indeed have called in queſtion the authenticity of the Chineſe annals; yet we find them confirmed, at leaſt as high as 660 years before Chriſt, by the annals of Japan. Dr Chambers argues that, "at worſt the Chineſe antiquities ſtand on as good a footing as thoſe of either Greece or Rome. Their annaliſts (he adds) both for order and chronology are not inferior to any of thoſe ancients ſo much admired among us; but far ſurpaſs them in point of antiquity, and have a better title to be credited, as having been written by public authority, which can be ſaid of few Greek or Roman pieces, except perhaps the Capitoline Marbles, which are not properly a hiſtory." But here we cannot help differing from the Doctor: for *public authority*, is by no means the beſt of guardians for *hiſtorical truth*; eſpecially in a country where this authority is placed entirely in the hands of an abſolute monarch, and where learning is monopolized by the prieſts. But the whole of the Chineſe chronology, has been attacked by Mr Coſtar, ſucceſsfully. The Britiſh have alſo laid claim to very high antiquity; but before Cæſar's invaſion their hiſtory is utterly dubious, not to ſay fabulous. Old chronicles ſpeak of Samothes, the ſon of Japhet, as the founder of the Britiſh monarchy; Albion a deſcendant of Cham, invaded it 200 years after; and about 600 years after this, Brute, grandſon of Æneas, came and took poſſeſſion of the iſland in the year of the world 2880, giving it the name which it ſtill retained when Cæſar made his attempt. This is Geoffry of Monmouth's ſyſtem of the antiquity of the Britiſh nation. It has been defended by A. Thomſon of Queen's College, in the preface to his Engliſh tranſlation of that writer. It muſt not be forgot that the Iriſh alſo pretend to be the moſt ancient of all nations; they trace their origin without interruption up to Japhet! And our ancient Scots hiſtorians have not been much behind hand with them, as they trace their origin from an elder branch of the Scythians, the firſt of men; and from a mixture of Scythians, Greeks, Jews, and Egyptians, who emigrated under the command of Gathelus the ſon of Cecrops, king of Athens, who married Scota the daughter of Pharaoh king of Egypt in the days of Moſes!

(3.) ANTIQUITY OF THE WORLD. There have been great diſputes concerning the antiquity of the world. Ariſtotle carried it back even to eternity. Parmenides, Pythagoras, and the Chaldeans, were of the ſame opinion: and there are not wanting philoſophers of the preſent age, who have adopted the ſame idea. Dr Thomſon has publiſhed two treatiſes on this ſubject: the one entitled the *Eternity of the World*, and the other the *Eternity of the Univerſe*. But the generality of philoſophers, as well as divines and hiſtorians, have always held an origin of it; though where to fix that origin, is the difficulty. The different ſyſtems of the chronology of the Greeks, the Egyptians, the Jews, the Hebrew text, and the Septuagint verſion, of Scaliger, of Pezron, of Sir Iſaac Newton, &c. to ſay nothing of the Chineſe annals, leave the point conſiderably embarraſſed. Dom. Pezron thought he merited well of the public by adding 2000 years to the age of the world, which

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had been taken from it by Scaliger and others; but this did not hinder F. Martianay from entering a profecution againſt him in the archbiſhop's court of Paris, for *hereſy*. His crime was following the heathen rather than the Hebrew chronology, in which however he was preceded by the generality of the fathers and primitive writers of the church; among whom it appears to have been a common practice, to make 5500 years between the creation and the incarnation. In reality, the Jews are charged with having corrupted their chronology; by which the moderns have been miſled. See CHRONOLOGY.

ANTIQUO-MODERN, an epithet applied to the old Gothic churches, and other buildings; to diſtinguiſh them from thoſe of the Greeks and Romans.

ANTIRATIONALISTS, a name ſometimes given to divines, who in matters of religion are for humbling reaſon, and making it bend to faith, aſſerting, that the abſurdity of a thing is no reaſon for rejecting it.

ANTIREPUBLICAN, againſt a commonwealth, or democratic government.

ANTI-RHODES, a ſmall iſland in the harbour of Alexandria. See ALEXANDRIA, ANCIENT STATE OF.

ANTIROYALIST, againſt a monarchy, or kingly government. See ANTIMONARCHICAL.

ANTIRRHESIS, or ANTIRRHETICUM, } [from ἀντὶ and ῥέω, *I ſpeak*,] in literary hiſtory, denotes a refutation of ſome book, author, or opinion.

ANTIRRHINUM, SNAP-DRAGON, or CALVES-SNOUT: A genus of the angioſpermia order, belonging to the didynamia claſs of plants; and in the natural method ranking under the 40th order, *Perſonatæ*. The eſſential characters are theſe: The calyx conſiſts of five leaves; the baſis of the corolla is bent backwards, and furniſhed with pectoria; the capſule is bilocular. There are 24 ſpecies of the antirrhinum, 10 of which are natives of Britain.

1. ANTIRRHINUM ARVENSE, the corn blue toad-flax.

2. ANTIRRHINUM CYMBALARIA, the ivy-leaved toad-graſs.

3. ANTIRRHINUM ELATINE, the ſharp-pointed fluellin.

4. ANTIRRHINUM LINARIA, the common yellow toad-flax. It is ſaid to be cathartic, and diuretic, but is not uſed in the ſhops.

5. ANTIRRHINUM MAJUS, the greater ſnap-dragon.

6. ANTIRRHINUM MINUS, the leaſt toad-flax.

7. ANTIRRHINUM MONOSPERMUM, the ſweet ſmelling toad-flax.

8. ANTIRRHINUM ORONTIUM, the leaſt ſnap-dragon.

9. ANTIRRHINUM REPENS, the creeping toad-flax.

10. ANTIRRHINUM SPURIUM, the round-leaved fluellin.

ANTIRRHIUM, in ancient geography, a promontory at the mouth of the Corinthian bay, where it is ſcarce a mile broad, and where it ſeparates the Ætolians from the Peloponneſus; ſo called from its oppoſite ſituation to Rhium in Peloponneſus; both are now called the *Dardanelles* of *Lepanto*.

ANTISABBATARIANS, a modern religious ſect, who deny the neceſſity of obſerving the Sabbath day. The chief arguments of the Antiſabbatarians, are, 1. that the Jewiſh ſabbath was only of ceremonial not moral obligation; and conſequently is aboliſhed by the coming of Chriſt: 2. that no other Sabbath was appointed to be obſerved by Chriſt or his apoſtles: 3. that there is not a word of *Sabbath-breaking* in all the New Teſtament: 4. that no command was given to Adam or Noah to keep any Sabbath; and, 5. that therefore, although Chriſtians are commanded "not to forſake the aſſembling of themſelves together," they ought not to hold one day more holy than another. See SABBATH.

ANTISAGOGE, in rhetoric, a figure differing little from that called *conceſſion*. The following paſſage from Cicero is an inſtance of it: *Difficilis ratio belli gerendi; at plena fidei, plena pietatis: et ſi dicas, magnus labor, multa pericula proponuntur: at gloria ex his immortalis eſt conſecutura.* See CONCESSION.

ANTISCEPTIC, ſomething oppoſed to the reaſonings and ſyſtem of Pyrrhoniſts, or ſceptics.

ANTISCIANS. See ANTISCII, N° 2.

(1.) * ANTISCH. *n. ſ. It has no ſingular.* [from ἀντὶ and σκιὰ.] In geography, the people who inhabit on different ſides of the equator, who, conſequently, at noon have their ſhadows projected oppoſite ways. Thus the people of the north are *Antiſcii* to thoſe of the ſouth; the one projecting their ſhadows at noon toward the north pole, and the other toward the ſouth pole. *Chambers.*

(2.) ANTISCII, is alſo uſed, among aſtrologers, for two points of the heavens, equally diſtant from the tropics.—Thus the ſign Leo and Taurus are held *antiſcii* to each other.

* ANTISCORBUTICAL. *adj.* [from ἀντὶ, againſt, and *ſcorbutum*, the ſcurvy.] Good againſt the ſcurvy.—The warm *antiſcorbutical* plants in quantities, will occaſion ſtinking breath, and corrupt the blood. *Arbuthnot.*

* ANTISCORBUTICK. *adj.* [from ἀντὶ, againſt, and *ſcorbutum*, the ſcurvy.] Good againſt the ſcurvy.—The warm *antiſcorbuticks*, animal diet, and animal ſalts, are proper. *Arbuthnot.*

(1.) ANTISEPTIC, [from ἀντὶ and σήπω, *putrid*,] an appellation given to ſuch ſubſtances as reſiſt putrefaction. Sir John Pringle has made ſome curious experiments in relation to antiſeptic ſubſtances, to aſcertain their ſeveral virtues. Thus in order to ſettle the antiſeptic virtue of ſalts, he compared it with that of common ſea-ſalt; which being one of the weakeſt, he ſuppoſes equal to unity, and expreſſes the proportional ſtrength of the reſt by higher numbers, as in the following table.

(2.) ANTISEPTIC PROPORTIONAL VIRTUES OF DIFFERENT SALTS.

Sea-ſalt	1	Saline mixture	3
Sal gemmæ	1+	Nitre	4+
Tartar vitriolated	2	Salt of hartſhorn	4+
Spiritus Mindereri	2	Salt of wormwood	4+
Tartarus ſolubilis	2	*Borax*	12+
Sal diureticus	2+	Salt of amber	20+
Crude *ſal ammoniac*	3	Alum	30+

(3.) ANTISEPTICS, VIRTUES OF, IN GENERAL. In the above table the proportions are marked in integral numbers: only to ſome there is added the ſign +, to ſhow, that thoſe ſalts are poſſeſſed of a ſtronger antiſeptic virtue than the number in the table expreſſes, by ſome fractions; unleſs in the three laſt, where the ſame ſign imports, that the ſalt may be ſtronger by ſome units. Some reſinous and other ſubſtances even exceed the antiſeptic virtues of the neutral ſalts; thus myrrh, aſafætida, terra japonica, and aloes, are at leaſt 12 times more antiſeptic than ſea-ſalt. Two grains of camphor as equivalent to 60 grains of that ſalt. An infuſion of a few grains of Virginian ſnake-root, in powder, exceeds 12 times its weight of ſea-ſalt. Peruvian bark and camomile flowers have nearly the ſame extraordinary quality. Beſides theſe, pepper, ginger, ſaffron, contrayerva-root, are 12 times more antiſeptic than ſea-ſalt. Dried ſage, rhubarb, the root of the wild valerian, mint, angelica, ground ivy, ſenna, green-tea, red roſes, wormwood, muſtard, and horſe-radiſh, were likewiſe found more antiſeptic than the ſtandard. To the claſs of antiſeptic medicines may likewiſe be added fermented liquors, acids, ſpirits, and even thoſe plants called *antiacids*, and erroneouſly ſuppoſed haſteners of putrefaction, particularly horſe-radiſh. Vegetables, poſſeſſing this virtue, are the more valuable, that being uſually free of acrimony, they may be taken in much greater quantities, than either ſpirits, acids, reſins, or even the neutral ſalts. Antiſeptics are preſcribed in all putrid, malignant, and peſtilential caſes. It is to be remarked, however, that different kinds of them are to be given in different diſeaſes, and in different ſtages of the ſame diſeaſe. Thus, the bark is a ſpecific in a gangrene, when the veſſels are relaxed, and the blood reſolved or diſpoſed to putrefaction; but will fail, if the veſſels are too full, or the blood be too thick. With the ſame caution is the bark to be uſed in wounds, viz. chiefly in caſes of abſorbed matter, when it infects the humours, and brings on a hectic fever. By the great antiſeptic virtue of alum, the bark, and other aſtringents, it ſhould ſeem, that aſtriction had no ſmall ſhare in the cure of putrid diſorders; and, indeed, the very nature of putrefaction conſiſts in a ſeparation or diſunion of the parts. But as aſtringents are improper to be adminiſtered in many caſes, contrayerva-root, ſnake-root, camphor, &c. may ſupply their place; which, though highly antiſeptic, have very little, or any, of an aſtringent quality.

ANTISIGMA, among the ancient grammarians, ſignifies one of the notes or ſentences affixed to thoſe verſes whoſe order was to be changed.

ANTISOPHIST, [from ἀντι, and σοφιστης, a ſophiſter.] a counter ſophiſter; one that diſputes on the oppoſite ſide.

* ANTISPASIS, *n. f.* [from ἀντι, againſt, and σπαω, to draw.] The revulſion of any humour into another part.

(1.) * ANTISPASMODICK. [from ἀντι, againſt, and σπασμος, the cramp.] That which has the power of relieving the cramp.

(2.) ANTISPASMODICS are more accurately defined, medicines proper for the cure of ſpaſms and convulſions. Opium, balſam of Peru, and the eſſential oils of many vegetables, are the principal in this claſs of medicines. Opium excels for its immediate effects. Peruvian balſam, in many inſtances, produces more laſting benefit than opium, and ſometimes ſucceeds where opium fails. As antiſpaſmodics, the eſſential oils differ in this from opium, that they act more on a particular part than on the ſyſtem in general, and have no ſpecific effect. Some medicines remove ſpaſms by immediate contact, as aſſes milk, cream, oil of almonds; others by repelling heat, as gas, ſulphur, nitre, ſal ammoniac, &c. And where the ſtrictures are produced by inanition and a defect of vital heat, ſpaſms are removed by thoſe medicines that reſtore the *vis vitæ*, ſuch as valerian, caſtor, muſk, &c.

* ANTISPASTICK. *adj.* [from ἀντι and σπαω.] Medicines which cauſe a revulſion of the humours.

ANTISPASTUS, a poetical foot, conſiſting of four ſyllables, whereof the firſt is ſhort, the ſecond and third long, and the fourth ſhort.

* ANTISPLENETICK. *adj.* [from ἀντι and *ſplenetick*.] Efficacious in diſeaſes of the ſpleen.—*Antiſplenetick* open the obſtructions of the ſpleen. *Floyer*.

ANTISPODIUM. See SPODIUM.

ANTISTA, a prieſteſs. See ANTISTES.

ANTISTANCARIANS, a ſect of German proteſtants who oppoſe the doctrine of Stancarius, who aſſerted that juſtification was the ſole effect of Chriſt's human nature, excluſive of his divinity.

(1.) ANTISTATIS, in antiquity, denotes the gibbous part of the liver in the Grecian victims.

(2.) ANTISTATIS, in oratory, a defence of an action from the conſideration that, had it been omitted, worſe would have enſued. This is called by Latin writers *comparativum argumentum*; ſuch, *e gr.* would be the general's defence who had made an inglorious capitulation, That, without it, the whole army muſt have periſhed.

ANTISTES, [from *ante*, before, and *ſto*, I ſtand, in eccleſiaſtical writers,] a title uſually given to biſhops, though ſometimes alſo to prieſts or presbyters. Among the ancient Romans, antiſtes was an appellation given to the chief of the prieſts in the provinces. Females of this rank were called *Antiſtæ*.

ANTISTHENES, a Greek philoſopher, and founder of the Cynics. He was born at Athens, and paſſed the early part of his life as a ſoldier. Having afterwards been an attendant at the lectures of Socrates, he was principally charmed with thoſe exhortations of that great philoſopher, which perſuaded to frugality, to temperance, and to moderation: theſe Antiſthenes was reſolved to practiſe by carrying every precept to its utmoſt extent. Permitting therefore his beard to grow, he went about the ſtreets in a thread-bare coat, ſcarcely to be diſtinguiſhed from a common beggar. He prided himſelf upon the moſt rigid virtue, and thought himſelf obliged to attack the vicious, wherever he found them. This gave him ſome reputation in the city; but it may be ſuppoſed, that, in a place ſo very luxurious as Athens, he had more enemies than diſciples. His philoſophy conſiſted rather in action than ſpeculation: it was therefore his conſtant maxim, That to be virtuous was to be happy, and that all virtue conſiſted

fisted in action; that the wise man should live for himself, contented in all situations, and happy alone in the conscious ness of his own virtue. He acknowledged nothing to be good but what was honourable; and asserted, that virtue might be acquired by practise. Laertius tells us there were 10 volumes of his works; and he has given us many of his apophthegms.

ANTISTICHON. See ANTISTOECHON.

ANTISTITIUM, is a term used in ancient chronicles for an abbey or monastery.

ANTISTOECHON, } [from ἀντὶ, and στοιχεῖον,
ANTISTOICHON, } letter,] a grammatical figure whereby one letter is used instead of another.

(1.) * ANTISTROPHE. *n. f.* [ἀντιστροφὴ, from ἀντὶ, the contrary way, and στροφὴ, turning.] In an ode supposed to be sung in parts, the second stanza of every three, or sometimes every second stanza; so called because the dance turns about.

(2.) ANTISTROPHE, [from ἀντὶ, and στρέφω, to turn,] a kind of dance in use among the ancients; wherein they stepped sometimes to the right and sometimes to the left, still doubling their turns or conversions. It was customary among the Greeks, on some occasions, to dance round the altars, whilst they sung the sacred hymns, which consisted of three stanzas, or parts: the first of which called *strophe*, was sung in turning from east to west; the other, named *antistrophe*, in returning from west to east. Then they stood before the altar, and sung the epode, which was the last part of the song. See STROPHE and ODE.

(3.) ANTISTROPHE, in grammar, a figure by which two things mutually depending on one another, are reciprocally converted; as, *the servant of the master, the master of the servant.*

(4.) ANTISTROPHE, in rhetoric, the same with what is more commonly called *epistrophe.*

* ANTISTRUMATICK. *adj.* [from ἀντὶ and *struma*, a scrophulous swelling.] Good against the king's evil.—I prescribed him a distilled milk, with *antistrumaticks*, and purged him. *Wiseman.*

ANTISYLLOGISM, in logic, a syllogism, which infers a contrary conclusion to that of another syllogism.

ANTITACTÆ, or } [from ἀντιτάσσω, to oppose
ANTITACTICI, } in church history, a branch of Gnostics, who held, that God was good and just, but that a creature had created evil; and consequently that it is our duty to oppose this author of evil, in order to avenge God of his adversary.

ANTITHENAR, in anatomy, a name given to divers muscles, otherwise called *adductors*, or *adducent muscles*; because they act as antagonists to the *thenars* or *abductors*. See ANATOMY, PART II. SECT. II.

(1.) * ANTITHESIS. *n. f.* in the plural *antitheses*. [ἀντίθεσις, placing in opposition.] Opposition of words or sentiments; contrast; as in these lines;

Though gentle, yet not dull,
Strong without rage, without o'erflowing, full.
Denham.

I see a chief, who leads my chosen sons,
All arm'd with points, *antitheses*, and puns.
Pope.

(2.) ANTITHESIS, in grammar, a figure whereby one letter is substituted in the room of another; as *olli* for *illi*.

(3.) ANITHESIS, in rhetoric, a contrast or opposition of words or sentiments. Such is that of Cicero, in his second oration against Cataline.—"On one side stands modesty, on the other impudence; on one fidelity, on the other deceit; here piety, there sacrilege; here continency, there lust, &c." Such also is that of Augustus to some seditious young men: *Audite, juvenes, senem, quem juvenem senes audivere:* and that of Seneca: *Curæ leves loquuntur, ingentes stupent.* St Augustine, Seneca, Salvian, and many other ancient writers, seem greatly to affect antitheses; but among the moderns they are generally decried.—Desmaretz represents them as the favourites of young writers.

ANTITHETARIUS, a term which occurs in the title of a chapter in the laws of Canute the great. It means a man who endeavours to discharge himself of the fact of which he is accused, by recriminating, i. e. by charging the accuser with the same fact.

ANTITHETIC is applied to controversy. In this sense, we meet with *antithetic* method, *antithetic* discourses, &c. Marcion composed a volume of Antitheses, or contrarieties and oppositions between the law and the gospel.

ANTITHETON, in rhetoric, a figure wherein contrarieties are set in opposition to each other. Some distinguish between the antithesis and antitheton. Vossius thinks that in the antitheton nouns and verbs are opposed, but in the *antithesis* epithets only. Others comprehend the antithesis under antitheton.

ANTITHETS, contraries, or opposites.

ANTITHORA. See ANTHORA.

ANTITRAGICUS, } muscles of the ear. See
ANTITRAGUS, } ANATOMY, § 195.

ANTITRINITARIANS, those who deny the Trinity, and teach that there are not three persons in the Godhead. Thus the Samosatenians, who do not believe the distinction of persons in God; the Arians who deny the divinity of the Word; and the Macedonians, who deny that of the Holy Spirit, are all properly Antitrinitarians. Among the moderns, Antitrinitarians are particularly understood of Socinians or Unitarians. The *Bibliotheca Antitrinitariorum*, or *Antitrinitarian Library*, is a posthumous work of Christopher Sandius, an eminent Antitrinitarian; wherein he gives a list, digested in order of time, of all the Socinian or modern Antitrinitarian authors, with a brief account of their lives, and a catalogue of their works. See UNITARIAN.

(1.) * ANTITYPE. *n. f.* [ἀντίτυπος.] That which is resembled or shadowed out by the type; that of which the type is the representation. It is a term of theology. See TYPE.—He brought forth bread and wine, and was the priest of the most high God; imitating the *antitype*, or the substance, Christ himself. *Taylor.*

(2.) ANTITYPE, among divines, is variously interpreted. It occurs twice in the New Testament; viz. in the Epistle to the Hebrews, ix. 24, and in St Peter, 1 Ep. iii. 21. where its genuine import has been much controverted. The former

ſays, that "Chriſt is not entered into the holy places made with hands, which are αντιτυπα, the figures or antitypes of the true—now to appear in the preſence of God for us." Now τυπος, ſignifies the pattern by which another thing is made; and as Moſes was obliged to make the tabernacle, and all things in it, according to the pattern ſhowed him in the mount; the tabernacle ſo formed was the antitype which was ſhewn to Moſes; any thing, therefore, formed of a model or pattern, is an antitype. In the latter paſſage, the Apoſtle, ſpeaking of Noah's flood, and the deliverance only of eight perſons in the ark from it, ſays, ω και ημας αντιτυπον νυν σωζει βαπτισμα, *baptiſm, being an antitype to that, now ſaves us; not putting away the filth of the fleſh, but the anſwer of a good conſcience towards God, &c.* The meaning is, that righteouſneſs, or the anſwer of a good conſcience towards God, now ſaves us by means of the reſurrection of Chriſt, as formerly righteouſneſs ſaved thoſe eight perſons by means of the ark, during the flood. The word *antitype*, therefore, here ſignifies a general ſimilitude of circumſtances; and the particle ω, *whereunto*, refers, not to the immediate anticedent, ὑδατος, *water*, but to all that precedes.

(3.) ANTITYPE, among the ancient Greek fathers, and in the Greek liturgy, is alſo applied to the ſymbols of bread and wine in the Sacrament. Hence it has been argued, by many Proteſtants, that the Greeks do not really believe the doctrine of tranſubſtantiation; becauſe they call the bread and wine *antitypes*, αντιτυπα, q.d. figures, ſimilitudes; and this even after the conſecration.

* ANTITYPICAL. *adj.* [from *antitype*.] That which relates to antitype; that which explains the type.

ANTIVARI, a ſtrong fortified town of Albania, in European Turkey, ſeated on a rock in the Adriatic ſea. It was taken from the Venetians by the Turks, in 1573. It is the ſee of a Greek Archbiſhop, and lies 10 miles W. of Dulcigno. Lon. 19. 40. E. Lat. 42. 10. N.

* ANTEVENEREAL. *adj.* [from αντι, and *venereal*.] Good againſt the venereal diſeaſe.—If the lues be joined with it, you will ſcarce cure your patient without exhibiting *antivenereal* remedies. *Wiſeman.*

ANTIVETRIA, a ſubdiviſion of New Caſtile in S. America, ſituated S. of Carthagena.

ANTIUM, in ancient geography, a city of the Volſci, ſituated on the Tuſcan ſea, yet without a harbour, becauſe they had a neighbouring hamlet caled *Ceno*, with a harbour. The Romans gained their firſt reputation in naval affairs againſt the Antiates: part of whoſe ſhips they conveyed into the arſenal of Rome and part they burnt; and with their beaks of roſtra adorned the pulpit erected in the Forum, thence called *Roſtra*. Here ſtood a famous temple of Fortune. Addiſon ſays, there were two Fortunæ worſhipped at Antium. It was deſtroyed by the Saracens, and is now extinct, but a veſtige of the name ſtill remains in *Capo d' Anzo*, or ANTIO.

ANTIUS, a ſon of Hercules, ſaid to have been the founder of ANTIUM.

(1.) * ANTLER. *n. ſ.* [*andouillier*, Fr.] Properly the firſt branches of a ſtag's horns; but popularly and generally, any of his branches.—Grown old, they grew leſs branched, and firſt loſe their brow *antlers*, or loweſt furcations next to the head. *Brown.*

(2.) ANTLER, among ſportſmen, a ſtart or branch of a deer's attire. See § 3. and 4.

(3.) ANTLER BES, the branch next above the brow-antler.

(4.) ANTLER BROW, the branch next the head.

ANTLIA, an ancient machine, ſuppoſed to be the ſame with the pump. Hence the phraſe, *in antlium condemnari*, according to the critics, denotes a kind of puniſhment, whereby criminals were condemned to drain ponds, ditches, or the like.

ANTOCOW, in farriery, a ſwelling in the breaſt of a horſe.

* ANTOECI. *n. ſ. It has no ſingular.* [Lat. from αντι and οικεω, to inhabit.] In geography, thoſe inhabitants of the earth, who live under the ſame meridian, and at the ſame diſtance from the equator; the one toward the north, and the other to the ſouth. Hence they have the ſame longitude, and their latitude is alſo the ſame, but of a different denomination. They are in the ſame ſemicircle of the meridian, but oppoſite parallels. They have preciſely the ſame hours of the day and night, but oppoſite ſeaſons; and the night of the one is always equal to the day of the other. *Chambers.*

(1.) ANTOINE, a town of France, in the department of Iſere, with a celebrated abbey. It is ſeated among the mountains, 13 miles E. of Lyons. Lon. 5. 15. E. Lat. 45. 43. N.

(2.) ANTOINE, St, a fort of Corunna.

ANTOINETTE, MARIE, the late unfortunate queen of France. See FRANCE and LEWIS XVI.

ANTOMOSIA, [from αντι, and ομνυω, I ſwear,] in ancient writers, an oath taken by both the parties in a criminal accuſation; whereby the accuſer charged the other with the fact, and the accuſed, in his turn, denied the ſame. Others ſay, antomoſia differed from diomoſia, antomoſia ſignifying the oath of the perſon accuſed, whereby he engaged to make a fair defence; and diomoſia to the proſecutor's oath, whereby he ſwore that his accuſation was juſtly founded.

ANTONA, a river of Britain, mentioned by Tacitus, which Cambden ſuppoſes to be a faulty reading for Avuona, or Auſuona, the Avon.

ANTONACUM, ANTONNACUM, or ANTUNNACUM, a town of the Treveri; now Andernach below Coblentz. Lon. 7. 5. E. Lat. 50. 25. N.

ANTONGIL, a large bay in the iſland of Madagaſcar, which is very ſafe and commodious for ſhips to ride in.

(1.) ANTONIA, daughter of Mark Anthony and Octavia, was equally virtuous, but equally unfortunate with her mother. While young, ſhe was married to Druſus, brother of Tiberius, who died on his return to receive a triumph for his victories in Germany. Diſconſolate at her loſs, Antonia would never enter into a ſecond marriage, but devoted herſelf to the education of her three children. The death of her ſon Germanicus, from the jealouſy of Tiberius, and the ill conduct of her younger ſon Claudius, and her daughter Livilla,

villa, was a ſource of new miſeries to this moſt excellent woman. She died in the reign of her grandſon, the infamous Caligula.

(2.) ANTONIA, a citadel of Jeruſalem, the origin of which we have in Joſephus; who ſays, that Hircanus, the firſt high prieſt of that name, built Baris near the temple, a houſe with turrets, where he generally reſided. Herod afterwards made it ſtronger, for the ſecurity and defence of the temple; and in honour of Mark Antony, who then commanded in the eaſt, called it Antonia.—It was very extenſive, and could accommodate a Roman legion. There was a full view of the temple from it.

(3.) ANTONIA, ST, a town of France, in the department of Aveiron, whoſe fortifications are demoliſhed. It is ſeated on the river Aveiron. Lon. 0. 55. E. Lat. 44. 10. N.

ANTONIANO, Silvio, a man of great learning, who raiſed himſelf from a low condition by his merit, was born at Rome in 1540. When only ten years old, he could make verſes upon any ſubject propoſed to him: and theſe ſo excellent, though pronounced extempore, that even a man of genius could not compoſe the like, without a good deal of time and pains. The duke de Ferrara coming to Rome, to congratulate Marcellus II. upon his being raiſed to the pontificate, was ſo charmed with the genius of Antoniano, that he carried him to Ferrara, where he provided able maſters to inſtruct him in the ſciences. From thence he was ſent for by Pius IV. who made him profeſſor of the belles lettres at Rome. He filled this place with ſo much reputation, that, on the day when he began to explain the oration *pro Marco Marcello*, he had a vaſt crowd of auditors, and among theſe, no leſs than 25 cardinals. He was afterwards choſen rector of the college; and after the death of Pius IV. being ſeized with a ſpirit of devotion, he joined himſelf to Philip Neri, and accepted the office of ſecretary to the ſacred college, offered him by Pius V. which he executed for 25 years, with the reputation of an honeſt and able man. He refuſed a biſhopric, which Gregory XIV. would have given him; but he accepted the office of ſecretary to the briefs, offered him by Clement VIII. who made him his chamberlain, and afterwards a cardinal. Antoniano killed himſelf by too great fatigue: for he ſpent whole nights in writing letters; which brought on a ſickneſs, whereof he died, in the 63d year of his age. He wrote with ſuch eaſe and fluency, that he hardly ever made any raſure; and it is ſaid, he preſerved his virginity during his whole life.

ANTONIAN WATER, in the materia medica, a medicinal water of Germany, remarkably pleaſant to the taſte, and of ſervice in many caſes as a medicine. This water, mixed with any acid liquor, raiſes a conſiderable effervescence, and with Rheniſh wine and ſugar, which is a common way of drinking it, makes a great hiſſing and bubbling, and becomes turbid and milky.—If powder of galls be added to it, it ſuffers no change, but remains limpid and colourleſs; but ſyrup of vitriol mixed with it, turns the whole green, whence it is plain that it contains an alkali; and if oil of tartar be added to it, it becomes turbid and milky, and precipitates a white ſediment, whence it appears, that there is either common ſalt, or a calcareous earth in it. When expoſed ſome time to the air in an open veſſel, like all other mineral waters, it loſes its pungent taſte, and pellucidity, becoming turbid and vapid. A quart of it evaporated with a very gentle heat, leaves two ſcruples of a very dry ſediment, which being ſeparated by another ſolution, is found to be one half of an alkaline ſalt, and the other a calcareous earth. Oil of vitriol, mixed with the ſalt, produces a great effervescence, and a penetrating ſcent ariſes, like that produced by the mixing of oil of vitriol and common ſalt. Hence it appears, that theſe waters contain a ſmall portion of ſea-ſalt, and a ſtill larger of a calcareous earth, and with theſe, a very conſiderable quantity of a ſubtile mineral ſpirit. It is a very temperate water, not too ſtrongly operating either by ſtool or urine; and hence it is a very proper drink for perſons in chronic and in many acute caſes, either alone, or mixed with wine, to ſupply the place of malt liquor, which is proper but in very few illneſſes. A continued uſe of it alone may alſo prove ſerviceable in hypochondriac caſes.

ANTONIDES VANDER GOES, John, an eminent Dutch poet, born at Goes in Zealand, in 1647. His parents were anabaptiſts, of good character, but in low circumſtances. They went to Amſterdam, when Antonides was about four years old; and at nine, he began his ſtudies, under Hadrian Junius and James Coceius. Antonides took great pleaſure in reading the Latin poets, and carefully compared them with Grotius, Heinſius, &c. He firſt attempted to tranſlate ſome pieces of Ovid, Horace, and other ancients; and, having formed his taſte on theſe excellent models, he at length undertook one of the moſt difficult taſks in poetry, to write a tragedy: this was entitled *Trazil*, or *The Invaſion of China*.—Antonides, however, was ſo modeſt, as not to permit it to be publiſhed. Vondel, who was then engaged in a dramatic piece, which was taken alſo from ſome event that happened in China, read Antonides's tragedy: and was ſo well pleaſed with it, that he declared, if the author would not print it, he would take ſome paſſages out of it, and make uſe of them in his own tragedy. He accordingly did ſo; and it was reckoned much to the honour of Antonides, to have written what might be adopted by ſo great a poet as Vondel was acknowledged to be, by all good judges.—Upon the concluſion of the peace between Great Britain and Holland, in the year 1696, Antonides wrote a piece, entitled *Bellona aan bund*, i. e. Bellona chained, a very elegant poem, conſiſting of ſeveral hundred verſes. He next wrote an ingenious heroic poem, which he entitled *The River Y*, the river on which Amſterdam is built. His parents had bred him an apothecary: but his poetic genius ſoon gained him the friendſhip of ſeveral perſons of diſtinction: particularly of Mr Buſſero, one of the lords of the admiralty at Amſterdam, and a great lover of poetry, who ſent him, at his own expence, to purſue his ſtudies at Leyden, where he remained till he took his degree of M. D. when his patron gave him a place in the admiralty. In 1678, Antonides married

Suſanna

Suſanna Bermans, a miniſter's daughter, who had alſo a talent for poetry. His marriage was celebrated by ſeveral eminent poets, particularly by the famous Peter Francius, profeſſor of eloquence, who compoſed ſome Latin verſes on the occaſion. After marriage, he did not much indulge his poetic genius; and within a few years he fell into a conſumption, of which he died in 1684, being only 37 years, and a few months old. He is eſteemed the moſt eminent Dutch poet after Vondel. His works have been printed ſeveral times, having been collected by father Anthony Tanſz. The laſt edition was printed by Nicholas Ten Hoom, at Amſterdam, in 1714, in 4to, under the direction of David Van Hoogſtraaten, one of the maſters of the Latin ſchool of that city, who added to it the life of the poet.

ANTONINA, the infamous wife of the great Beliſarius, who not only repeatedly diſhonoured her huſband, by her infidelities, but perſecuted her own ſon Photius, with the utmoſt virulence, becauſe he had diſcovered her intrigues, and revealed them to his injured ſtepfather. In the language of Mr Gibbon, who gives her ſecret hiſtory at large, in his 4th volume of the Decline and Fall of the Roman Empire, "ſhe was, in the various ſituations of fortune, the companion, the enemy, the ſervant, and the favourite of the empreſs Theodora," a woman as wicked and worthleſs as herſelf. "Theſe looſe and ambitious females," adds Gibbon, "had been connected by ſimilar pleaſures: they were ſeparated by the jealouſy of vice, and at length reconciled by the partnerſhip of guilt."

ANTONINE COLUMN. See ANTONINUS, N° 3.

(1.) ANTONINUS, Aurelius Fulvius, ſirnamed PIUS, the Roman emperor, was born at Lanuvium in Italy, A. D. 86, of a family originally from Niſmes in Languedoc. His character was in all reſpects one of the nobleſt that can be imagined; and he had the title of *Pius* given him by the ſenate. We have no regular account of the tranſactions of his reign, as Capitolinus has written in a very confuſed manner; and we have only an abridgement of Dion Caſſius's hiſtory by Xiphilin now remaining. He managed the public revenues with great frugality, yet was extremely generous; was fond of peace, and in war preferred the reputation of juſtice to all the advantages which might be gained by victory. He was more intent upon preſerving the bounds of his empire than extending them; and he often made uſe of Scipio's expreſſion, That he choſe rather to ſave one citizen than kill a thouſand enemies. By this conduct he made himſelf univerſally eſteemed and revered in that age, and admired by poſterity. This great and good emperor died in 161, aged 75, having reigned 23 years.

(2.) ANTONINUS, Marcus Aurelius, ſirnamed THE PHILOSOPHER, the Roman emperor, born at Rome, the 26th of April, A. D. 121. He was called by ſeveral names till he was admitted into the Aurelian family, when he took that of Marcus Aurelius Antoninus. Adrian, upon the death of Cejonius Commodus, turned his eyes upon Marcus Aurelius; but, as he was not then 18 years of age, and conſequently too young for ſo important a ſtation, he fixed upon ANTONINUS PIUS, (See N° 1.) whom he adopted, upon condition that he ſhould likewiſe adopt Marcus Aurelius. The year after this adoption, Adrian appointed him queſtor, though he had not yet attained the age preſcribed by the laws. After the death of Adrian, Aurelius married Fauſtina, the daughter of Antoninus Pius, by whom he had ſeveral children. In the year 139, he was inveſted with new honours by the emperor, in which he behaved in ſuch a manner as endeared him to that prince and the whole people. Upon the death of Pius, which happened in 161, he was obliged by the ſenate to take upon him the government; in the management of which he took Lucius Verus as his colleague. Dion Caſſius ſays, that the reaſon of doing this was, that he might have leiſure to purſue his ſtudies, and on account of his ill ſtate of health; Lucius being of a ſtrong vigorous conſtitution, and conſequently more fit for the fatigues of war. The ſame day he took upon him the name of Antoninus, which he gave likewiſe to Verus his colleague, and betrothed his daughter Lucilla to him. The two emperors went afterwards to the camp; where, after having performed the funeral rites of Pius, they pronounced each of them a panegyric to his memory. They diſcharged the government in a very amicable manner. It is ſaid that, ſoon after Antoninus had performed the apotheoſis of Pius, petitions were preſented to him by the pagan prieſts, philoſophers, and governors of provinces, in order to excite him to perſecute the Chriſtians; which he rejected with indignation, and interpoſed his authority for their protection, by writing a letter to the common aſſembly of Aſia, then held at Epheſus. Euſebius has preſerved a copy of this letter, (*Hiſt. Ecc. lib.* iv. *c.* 13.) which he aſcribes, by miſtake to Antoninus Pius. The happiness which the empire began to enjoy under these two emperors was interrupted, in the year 162, by a dreadful inundation of the Tiber, which deſtroyed a vaſt number of cattle, and occaſioned a famine at Rome. This calamity was followed by the Parthian war; and at the ſame time the Catti ravaged Germany and Rhætia. Lucius Verus went in perſon to oppoſe the Parthians; and Antoninus continued at Rome, where his preſence was neceſſary. During this war with the Parthians, about the year 163 or 164, Antoninus ſent his daughter Lucilla to Verus, ſhe having been betrothed to him in marriage, and attended her as far as Brandusium: he intended to have conducted her to Syria; but it having been inſinuated to ſome perſons, that his deſign of going into the eaſt was to claim the honour of having finiſhed the Parthian war, he returned to Rome. The Romans having gained a victory over the Parthians, who were obliged to abandon Meſopotamia, the two emperors triumphed over them at Rome in 166; and were honoured with the title of *Fathers of their country*. This year was fatal, on account of a terrible peſtilence which ſpread itſelf over the whole world, and a famine under which Rome laboured: it was likewiſe in this year that the Marcomanni, and many other people of Germany, took up arms againſt the Romans; but the two emperors having marched in perſon againſt them, obliged the Germans to ſue for peace. The war, however,

however, was renewed the year following, and the two emperors marched again in perſon; but Lucius Verus was ſeized with an apoplectic fit, and died at Altinum. The Romans were now defeated with great ſlaughter; and the emperor, not chooſing to burden his ſubjects with new taxes, expoſed to public ſale the furniture of the palace, the gold and ſilver plate belonging to the crown, and his wife's rich garments embroidered with gold, and a curious collection of pearls which Adrian had purchaſed during his long progreſs through the provinces of the empire, and was called *Adrian's cabinet*. In 170, Antoninus made vaſt preparations againſt the Germans, and carried on the war with great vigour. During this war, in 174, a very extraordinary event is ſaid to have happened, which, according to Dion Caſſius, was as follows: Antoninus's army being blocked up by the Quadi, in a very diſadvantageous place, where there was no poſſibility of procuring water; in this ſituation, being worn out with fatigue and wounds, oppreſſed with heat and thirſt, and incapable of retiring or engaging the enemy, in an inſtant the ſky was covered with clouds, and there fell a vaſt quantity of rain. The Roman army were about to quench their thirſt, when the enemy came upon them with ſuch fury, that they muſt certainly have been defeated, had it not been for a ſhower of hail, accompanied with a ſtorm of thunder and lightning, which fell upon the enemy, without the leaſt annoyance to the Romans, who by this means gained the victory. The Pagans as well as Chriſtians have acknowledged the truth of this prodigy, but have greatly differed as to the cauſe of ſuch a miraculous event; the former aſcribing it to magicians. In Antoninus's pillar, the glory is aſcribed to Jupiter the god of rain and thunder. But the Chriſtians affirmed, that God granted this favour at the prayer of the Chriſtian ſoldiers in the Roman army, who are ſaid to have compoſed the 12th legion; and, as a mark of diſtinction, we are told that they received the title of the *Thundering Legion*, from Antoninus (*Euſeb. Eccleſ. Hiſt. lib.* v. *cap.* 5.) Mr Moyle, in the letters publiſhed in the ſecond volume of his works, has endeavoured to explode this ſtory of the Thundering Legion; which occaſioned Mr Whiſton to publiſh an anſwer, in 1726. In 175, Antoninus made a treaty with ſeveral nations of Germany. Soon after, Avidius Caſſius, governor of Syria, revolted from the emperor: this inſurrection, however, was put an end to by the death of Caſſius, who was killed by a centurion named *Anthony*. Antoninus behaved with great lenity towards thoſe who had been engaged in Caſſius's party: he would not put to death, nor impriſon, nor even ſit in judgment himſelf upon any of the ſenators engaged in this revolt; but he referred them to the ſenate, fixing a day for their appearance, as if it had been only a civil affair. He wrote alſo to the ſenate, to act with indulgence rather than ſeverity; not to ſhed the blood of any ſenator or perſon of quality, or of any other perſon whatſoever, but to allow this honour to his reign, that, even under the misfortune of a *rebellion*, none had loſt their lives, except in the firſt heat of the tumult. In 176, Antoninus viſited Syria and Egypt: the kings of thoſe countries, and ambaſſadors from Parthia, came to viſit him. He ſtaid ſeveral days at Smyrna; and, after he had ſettled the affairs of the eaſt, went to Athens, on which city he conferred ſeveral honours, and appointed public profeſſors there. From thence he returned to Rome with his ſon Commodus, who was choſen conſul for the year following, though he was then but 16 years of age. On the 27th of September, the ſame year, he gave him the title of *Imperator*; and on the 23d of December, he entered Rome in triumph, along with Commodus, on account of the victories gained over the Germans. Dion Caſſius tells us, that he remitted all the debts which were due to himſelf and the public treaſury, during 46 years, from the time that Adrian had granted the ſame favour, and burnt all the writings relating to thoſe debts. He applied himſelf likewiſe to correct many enormities, and introduced ſeveral excellent regulations. In 179, he left Rome with his ſon Commodus, to go againſt the Marcomanni, and other barbarous nations; and the year following gained a conſiderable victory over them, and would, in all probability, have entirely ſubdued them, had he not been ſeized with an illneſs, which carried him off on the 17th of March 180, in the 59th year of his age, and 19th of his reign. The whole empire regretted the loſs of ſo valuable a prince, and paid the greateſt regard to his memory: he was ranked amongſt the gods, and almoſt every perſon had a ſtatue of him in their houſes. His book of Meditations has been much admired.

(2.) ANTONINUS'S COLUMN, a circular pillar of white marble, raiſed in honour of the emperor Antoninus, (N° 2.) at Rome, 168 feet high above ground, beſides 7 feet under ground. It has a ſtair-caſe within conſiſting of 198 ſteps, and illuminated with 56 ſmall windows. Its ſhaft is adorned with a baſſo relievo, running in a ſpiral line its whole length, and containing a brief hiſtory of the emperor's reign.

(4.) ANTONINUS'S WALL, the third rampart that had been built by the Romans againſt the incurſions of the North Britons. It is called by the people in the neighbourhood *Graham's Dyke*, from the notion that one Graham, or Grimus, firſt made a breach in it after the retreat of the Romans out of Britain. The firſt barrier erected by the Romans was the chain of forts built by Agricola from the frith of Forth to that of Clyde, in the year 81, to protect his conqueſts from the inroads of the Caledonians. See AGRICOLA. The ſecond was the vallum or dyke ſtung up by Adrian in the year 121. See ADRIAN'S WALL. It terminated on the weſtern ſide of the kingdom, at *Axelodunum*, or *Burgh*, on the Solway Sands; and was ſuppoſed to have reached no further than *Pons Ælii*, or *Newcaſtle*, on the eaſtern ſide. But from an inſcription lately diſcovered, it appears to have extended as far as the wall of Severus. See SEVERUS'S WALL. This rampart of Adrian's was ſituated much farther ſouth than Agricola's chain; the country to the north having been either, according to ſome authors, recovered by the native Britons after the departure of Agricola; or, according to others, voluntarily ſlighted by Adrian. However, this work of Adrian's did not long continue to be the extreme boundary of

the Roman territories to the north in Britain. For Antoninus Pius having, by his lieutenant Lollius Urbicus, recovered the country once conquered by Agricola, commanded another rampart to be erected between the friths of Forth and Clyde, in the tract where Agricola had formerly built his chain of forts. The great number of inſcriptions which have been found in or near the ruins of this wall, to the honour of Antoninus Pius, leave us no room to doubt its having been built by his orders. If the fragment of a Roman pillar with an inſcription, now in the college library of Edinburgh, belonged to this work, as it is generally ſuppoſed to have done, it fixes the date of its execution to the third conſulſhip of Antoninus, which was A. D. 140, only 20 years after that of Adrian, of which this ſeems to have been an imitation. This wall, as ſome imagine, reached from Caerridden on the frith of Forth, to Old Kirkpatrick on the Clyde; or, as others think, from Kinniel on the E. to Dunglaſs on the W. Theſe different ſuppoſitions hardly make a mile of difference in the length of this work, which, from ſeveral actual menſurations, appears to have been 37 Engliſh, or 40 Roman miles. Capitolinus, in his life of Antoninus Pius, affirms, that the wall which that emperor built in Britain was of turf. This is unqueſtionably true; though it is evident from the veſtiges of it ſtill remaining, (which not very many years ago were dug up and examined for near a mile together), that the foundation was of ſtone. Mr Camden alſo tells us, from the papers of one Mr Anthony Pont, that the principal rampart was faced with ſquare ſtone, to prevent the earth from falling into the ditch. The chief part of this work were, 1. A broad and deep ditch, whoſe dimenſions cannot now be diſcovered with certainty, though Mr Pont ſays it was 12 feet wide. 2. The principal wall, about 12 feet thick at the foundation, but its original height cannot now be determined. This wall was ſituated on the S. brink of the ditch. 3. A military way on the S. ſide of the principal wall, well paved, and raiſed a little above the level of the ground. This work, as well as that of Adrian, was defended by garriſons placed in forts and ſtations along the line of it. The number of theſe forts, whoſe veſtiges were viſible in Mr Pont's time, were 18, ſituated about two miles from each other. In the intervals between the forts, there were watch towers; but their number and diſtances from each other cannot now be diſcovered. It is not a little ſurpriſing, that though it is now more than 1660 years ſince this work was finiſhed, and more than 1300 ſince it was ſlighted, we can yet diſcover, from authentic monuments, which are ſtill remaining, by what particular body of Roman troops almoſt every part of it was executed. This diſcovery is made from inſcriptions upon ſtones, which were originally built into the face of the wall, and have been found in or near its ruins, and are carefully preſerved. The number of ſtones with inſcriptions of this kind now extant is 11; of which ſix may be ſeen at one view in the college of Glaſgow, one in the college of Aberdeen, one in the college of Edinburgh, one in the Collection of Baron Clerk, one at Cochnoch houſe, and one at Calder houſe. From theſe inſcriptions it appears in general, that this great work was executed by the 2d legion, the vexillations of the 6th legion and of the 20th legion, and one cohort of auxiliaries. If theſe corps were all complete, they would make in all a body of 7800 men. Some of theſe inſcriptions have ſuffered greatly by the injuries of time and other accidents; ſo that we cannot diſcover from them with abſolute certainty, how many paces of this work were executed by each of theſe bodies of troops. The ſum of the certain and probable information contained in theſe inſcriptions, as it is collected by the learned Mr Horſley, ſtands thus:

	Paces.
The ſecond legion built	11,603
The vexillation of the ſixth legion . .	7,411
The vexillation of the twentieth legion	7,801
All certain	26,815
The vexillation of the twentieth legion, the monument certain, and the number probable	3,411
The ſame vexillation, on a plain monument, no number viſible, ſuppoſed	3,500
The ſixth legion, a monument, but no number, ſuppoſed	3,000
Cohors prima Cugernorum . . .	3,000
Total	39,726

or 39 miles 726 paces, nearly the whole length of the wall. It would have been both uſeful and agreeable to have known how long time theſe troops were employed in the execution of this great work. But of this we have no information. Neither do we know what particular bodies of troops were in garriſon in the ſeveral forts and ſtations along the line of this wall, becauſe theſe garriſons were withdrawn before the *Notitia Imperii* was written. Though we cannot diſcover exactly how many years this wall continued to be the boundary of the Roman territories in Britain, yet we are certain it was not very long. For we are told by Dion Caſſius, that, "Commodus, the ſon of ANTONINUS, (N° 2.) had wars with ſeveral foreign nations, but none ſo dangerous as that of Britain. For the people of the iſland, having paſſed the wall which divided them from the Romans, attacked them, and cut them in pieces." This was about A. D. 180.

(1.) ANTONIO, Nicholas, knight of the order of St James and canon of Seville, was born at Seville in 1617, being the ſon of a gentleman whom Philip IV. made preſident of the admiralty in that city in 1626. After having gone through a courſe of philoſophy and divinity in his own country, he went to ſtudy law at Salamanca; where he attended the lectures of Franciſco Ramos del Manzano, afterwards counſellor to the king, and preceptor to Charles II. Upon his return to Seville, he employed himſelf ſeveral years in writing his *Bibliotheca Hiſpanica*, having the uſe of the books of Bennet de la Sana, abbot of the royal monaſtery of Benedictines. In 1659, he was ſent to Rome by Philip IV. in the character of agent-general: he had alſo particular commiſſions from the inquiſition of Spain, the viceroys of Naples and Sicily, and the governor of Milan, to negociate their affairs at Rome. The cardinal of

of Arragon procured him, from Pope Alexander VII. a canonry in the church of Seville, the income whereof he employed in charity and purchaſing books: of which he had above 30,000 volumes in his library. By theſe means, and his own indefatigable application, he was at laſt enabled to finiſh his Bibliotheca Hiſpanica, in 4 volumes folio, two of which he publiſhed at Rome in the year 1672. The work conſiſts of two parts; the one containing the Spaniſh writers who flouriſhed before the 15th century, and the other thoſe ſince the end of that century. After the publication of theſe two volumes, he was recalled to Madrid by Charles II. to take upon him the office of counſellor to the cruſade; which he diſcharged with great integrity till his death, in 1684. He left nothing but his vaſt library, which he had brought from Rome to Madrid; and his two brothers and nephews being unable to publiſh the remaining volumes of his Bibliotheca, ſent them to Cardinal d'Aguiſne, who paid the charge of the impreſſion, and committed the care of it to Monſieur Marti, his librarian, who added notes in the name of the Cardinal.

(2.) ANTONIO, de Meſſine, a native of Meſſina, who flouriſhed about the year 1430. He was the firſt Italian who painted in oil, which art he learned from John Van Dyck in Flanders. When he returned to Italy he imparted his ſecret to Bellini and Dominico, the laſt of whom revealed it to Andrew del Caſtagno, who, from a thirſt of gain, baſely aſſaſſinated him. Theſe incidents, however, ſpread the art of oil painting over Italy.

(3.) ANTONIO, St, a Dutch Fort in Axim, on the gold coaſt of Africa. It ſtands on a high rock, which projects into the ſea in form of a peninſula; and is ſo environed by rocks and dangerous ſhoals, as to be inacceſſible to an enemy but by land, where it is fortified by a parapet, draw-bridge, and two batteries of heavy cannon. Beſides this it has a battery towards the ſea. The three batteries conſiſt of 24 cannon. Its form is triangular; the building is neat, ſtrong, and commodious for its extent, which is but ſmall, on account of the narrowneſs of the rock on which it is built. The garriſon is uſually compoſed of 25 white men, and an equal number of negroes, under the command of a ſergeant. It is maintained at the expence of the Weſt-India Company; and, when well ſtored with proviſions, is capable of making a long defence againſt any number of negroes. It is, however, as well as all other forts on this coaſt, liable to inconveniencies from the heavy rains, which damage the walls, and render frequent reparations neceſſary. This obliges the Dutch always to keep ready a quantity of lime made of calcined oyſter ſhells, of which the coaſt produces great numbers. This ſettlement was firſt founded by the Potugueſe, during the reign of Emmanuel. They fixed at firſt upon a ſmall point; where, finding themſelves inſecure, they built the fort where it now ſtands. They were driven out by the Dutch in 1642; and, upon the concluſion of a peace with the States-general, the fort remained by treaty in the hands of the Dutch Weſt-India Company, who have kept poſſeſſion of it ever ſince.

(4.) ANTONIO, St, a mountain of Spain.

(5.) ANTONIO, St, a ſea-port of Biſcay.

(6.) ANTONIO, St, one of the Cape de Verd iſlands, ſeparated from St Vincent's, by a clear navigable channel, 15 miles broad. On the N. ſide, it has a good road for ſhipping, with a collection of freſh water, riſing from ſprings, which, however, ſcarcely merits the name of a pond.—The iſland ſtretches from NE. to SW. and is filled with mountains; one of which is of ſo extraordinary a height, as to be compared with the Peak of Teneriffe: Its top is conſtantly covered with ſnow, and, notwithſtanding the clearneſs of the ſky, is generally hid in clouds. Here are produced a variety of fruits; oranges, lemons, palms, melons, &c. and ſome ſugar canes. The potatoes and melons are particularly excellent, and are much ſought after by mariners. But, notwithſtanding all this plenty, the inhabitants live in the moſt wretched poverty. They are in number about 500, chiefly negroes, under the Portugueſe, whoſe language they ſpeak, and whoſe manners they imitate. To the NW. ſtands a village, under the direction of a governor, or, as they call him, a captain, a prieſt, and a ſchoolmaſter.—Lon. 0. 26. E. Lat. 18. 4. N.

(1.) ANTONIUS, Caius, the ſon of Marcus the orator, (No. 4.) and uncle to the triumvir, (No. 5.) had the command of ſome troops of horſe under Sylla, and plundered many places in Greece.

(2.) ANTONIUS GNYPHO, a native of Gaul, who came to Rome, and taught rhetoric and poetry, in the houſe of Julius Cæſar, while he was but a boy. His ſchool was frequented by Cicero and other great men. He ſet no price upon his labours, which made his ſcholars the more liberal to him.

(3.) ANTONIUS, Julius, the ſon of Marcus, (No. 5.) was conſul along with Paulus Fabius Maximus, and is immortalized by Horace, who addreſſes the 2d ode of his 4th book to him.

(4.) ANTONIUS, Marcus, a famous Roman orator. While he filled the office of prætor, Sicily fell to his lot, and he cleared the ſeas of the pirates which infeſted that coaſt. He was made conſul, with A. Poſthumius Albinus, in the year of Rome 653; when he oppoſed the turbulent deſigns of Sextus Titus, tribune of the people, with great reſolution and ſucceſs. Some time after, he was made proconſul of Cilicia, where he performed ſo many great exploits, that he obtained the honour of a triumph. To improve his talent for eloquence, he attended the greateſt orators at Rhodes and Athens, in his way to Cilicia, and on his return to Rome. Soon after, he was appointed cenſor: which office he diſcharged with great reputation, having carried his cauſe before the people, againſt Marcus Duronius, who had accuſed him of bribery, in revenge for Antonius's having eraſed his name out of the liſt of ſenators, becauſe Duronius, when tribune of the people, had abrogated a law, which reſtrained immoderate expence in feaſts. He was one of the greateſt orators ever known at Rome; and it was owing to him, according to the teſtimony of Cicero, that Rome might boaſt herſelf a rival even to Greece itſelf in eloquence. He defended, amongſt many others, Marcus Aquilius; and moved

ved the judges in ſo ſenſible a manner, by the tears he ſhed, and the ſcars he ſhowed upon the breaſt of his client, that he carried his cauſe. He never would publiſh any of his pleadings, that he might not be proved to ſay in one cauſe, what might be contrary to what he ſhould advance in another. He affected to be a man of no learning. His modeſty, and many other qualifications, rendered him no leſs dear to many perſons of diſtinction, than his eloquence made him univerſally admired. He was killed during thoſe bloody confuſions raiſed at Rome by Marius and Cinna. He was diſcovered in the place where he hid himſelf, and ſoldiers were ſent to diſpatch him; but his manner of addreſſing them had ſuch an effect, that none but he who commanded them, and had not heard his diſcourſe, had the cruelty to kill him. His head was expoſed before the roſtra, a place which he had adorned with his triumphal ſpoils. This happened A. A. C. 90.

(5.) ANTONIUS, Marcus, the triumvir, grandſon to the former, was very handſome in his youth; for which he was greatly beloved by Curio a ſenator; who, by carrying him about in all his debaucheries, made him contract ſuch heavy debts, that his own father forbade him his houſe. Curio, however, was ſo generous as to bail him for 250 talents. When the civil war broke out, Curio took Cæſar's part, and prevailed with Antonius to do the ſame; for which he was made a tribune of the people, and in that office did Cæſar great ſervice. Cæſar, having made himſelf maſter of Rome, gave Antonius the government of Italy: at the battle of Pharſalia, Cæſar confided ſo much in him, that he gave him the command of the left wing of his army, whilſt he himſelf led the right. After Cæſar was made dictator, he made Antonius general of the horſe, in which ſtation he exerted his power with the utmoſt violence. He was made conſul, when Cæſar enjoyed that honour for the fifth and laſt time. On Cæſar's death, he harangued the populace with great art, and raiſed their fury againſt his murderer; flattering himſelf, that he ſhould eaſily get into the place which Cæſar had filled: but his haughty behaviour made him loſe all the advantages his affected concern for Cæſar had gained him. His ill treatment of Octavius, and quarrel with him, produced another civil war; which ended in an accommodation between him, Octavius, and Lepidus, fatal to the peace of Rome. They agreed to ſhare the ſupreme power among them; and many of the moſt illuſtrious Romans were ſacrificed by proſcription, to cement this bloody league, which is known by the name of the *Second Triumvirate*. But the triumvirs were too ambitious, and hated one another too much, to be long united. Antonius went into Aſia to raiſe money for his ſoldiers; during his abſence, Fulvia his wife quarrelled with Octavius. When Antonius was in Aſia, indulging himſelf in all manner of luxury, the famous Cleopatra inſpired him with the moſt violent paſſion. Hearing of the quarrel between Fulvia and Octavius, and finding Octavius was become publicly his enemy, Antonius entered into a confederacy with Sextus Pompeius, who was ſtill maſter of Sicilly. He then went into Italy, to fight Octavius; but Fulvia, who had been the promoter of this war, dying, Octavius and Antonius came to an agreement. One of the conditions of this new peace was, that they ſhould together attack Pompey, though the former had lately made an alliance with him. Antonius then married Octavia, ſiſter to Octavius, as a pledge of their renewed friendſhip; but returned ſoon after to his beloved Cleopatra, and lived with her in Alexandria. Octavius took hold of this pretence to inveigh againſt him, and begin the war again. At laſt, they engaged in a ſea-fight at Actium, in which Octavius gained a complete victory. The infatuated Antonius fell upon his own ſword; and Cleopatra ſtung herſelf to death with an aſp, to avoid gracing the victor's triumph at Rome.

* ANTONOMASIA. *n. ſ.* [from ἀντὶ, and ὄνομα, a name.] A form of ſpeech, in which, for a proper name, is put the name of ſome dignity, office, profeſſion, ſcience, or trade; or when a proper name is put in the room of an appellative.—Thus a king is called his majeſty; a nobleman, his lordſhip. We ſay the philoſopher, inſtead of Ariſtotle, and the orator for Cicero; thus a man is called by the name of his country, a German, an Italian; and a grave man is called a Cato, and a wiſe man a Solomon. *Smith's Rhetoric.*

ANTONOMASTICALLY. *adv.* Performed by the figure antonomaſia.

ANTONOWOSKOI GORKA, a village of Novogorod, in Ruſſia, with a convent in it.

ANTON'S KLOSTER, Sr, a town in Ruſſia.

ANTOPHYLLUS, in botany, the fruit of the clove tree.

ANTOSIANDRIANS, a ſect of rigid Lutherans, who oppoſe the doctrine of Oſiander, relating to juſtification. Theſe are otherwiſe denominated Oſiandromaſtiges. The Antoſiandrians deny that man is made juſt, with that juſtice wherewith God himſelf is juſt; that is, they aſſert, that he is not made eſſentially, but only imputatively, juſt; or, that he is not really made juſt, but only pronounced ſo.

ANTRAIN, a town of France, in the department of Ille and Vilaine, ſeated on the Cenefnon, on the borders of the ci-devant province of Normandy, 15 miles S. of Avranches. Lon. 1. 41. E. Lat. 48. 33. N.

* ANTRE. [*antre*, Fr. *antrum*, Lat.] A cavern; a cave: a den: not in uſe.—

With all my travels hiſtory:
Wherein of *antres* vaſt, and deſarts idle,
It was my bent to ſpeak. *Shak-ſpeare.*

(1.) ANTRIM, a county of Ireland, in the province of Ulſter, and the moſt northerly one in the iſland. It is bounded by that of Down on the SE. thoſe of Tyrone, and Londonderry on the W. (from which laſt it is ſeparated by the river Bann.) part of Armagh on the S. St George's channel on the E. and the Deucaledonian ocean on the N. Its greateſt length is about 46 miles, its greateſt breadth about 27; and the number of acres it contains, plantation meaſure, are computed at 383,000. Though the country is much incumbered with bogs, and marſhes, yet it enjoys a pretty good air, and is well peopled, chiefly with proteſtants. Where it is free from bogs the ſoil is fruitful. It ſends two members to parliament, for

for the ſhire, and two for each of the following towns, viz. Liſburn, Belfaſt, Antrim, and Randalſtown. Certain narrow valleys, called *glyns*, beginning here, and running a great way along the coaſt, belonged formerly to the Biſſets, noblemen of Scotland, who, having been obliged to quit that country for having aſſaſſinated Patrick earl of Athol upon a private quarrel, came hither, and had a great eſtate beſtowed upon them by Henry III. of England; of which, in the reign of Edward II. a part was forfeited by the rebellion of Hugh, then chief of the family. Another tract near this, called the *Rowte*, belonged anciently to the Macguillers, but now to the M'Donnels earls of Antrim. Upon the coaſt of this county are the promontories called by Ptolemy, *Robogdium*, *Vennicinium*, and *Boræum*, now *Fair Foreland*, *Ramſhead*, and *St Helen's Head*. The river ſtyled by the ſame author *Vidua*, and now *Crodagh*, runs through this county.—Antrim contains two remarkable natural curioſities; viz. the GIANT'S CAUSEWAY, and LOUGH NEAGH, which ſee. The waters of Lough Neagh are of a petrifying quality. The linen manufacture is carried on very extenſively in this county. The amount is eſtimated at L.163,200 a year.

(2.) ANTRIM, the capital of the county of Antrim (N° 1.) ſeated at the N. end of Lough-Neagh, about ſix miles from the mouth of the bay, having a good road before it, with a pier near the place, within which veſſels lie dry at low water. It lies 13 miles W. from Carrickfergus, and 84 N. from Dublin, was anciently a borough of great conſequence, as appears from the mayor's being admiral of a conſiderable extent of coaſt, as well in Down as in this county; the corporation enjoying the cuſtoms paid by all veſſels within thoſe bounds, the creeks of Bangor and Belfaſt only excepted. This grant the crown repurchaſed, and transferred the cuſtom houſe to Belfaſt, to which it is now much inferior, both in ſize and in trade. It is, however, ſtill a place of note, and ſends two members to the houſe of commons. At Antrim is a ſeat, with noble demeſnes, and beautiful and highly cultivated lands, of the earl of Maſſareene. Lon. 6. 26. W. Lat. 54. 45. N.

ANTRUM, [Lat. a den, or cave,] in anatomy, a cavity; in which ſenſe it gives name to ſeveral parts of the body; ſuch as,

1. ANTRUM BUCCINOSUM is uſed by ſome anatomiſts for the cochlea of the ear.

2. ANTRUM GENÆ, a large cavity in the 4th bone of the upper jaw, thus called by Caſſerius, but by Dr Highmore *antrum maxillæ ſuperioris*. See ANATOMY, § 170.

3. ANTRUM HIGHMORIANUM is a cavity within the ſinus of each auxiliary bone. Surgeons ſometimes miſtake this for a *caries* of the bone; finding they can penetrate ſo deep into it with a probe.

4. ANTRUM PYLORI, a large cavity at the bottom of the Pylorus, thus denominated by Willis, who aſſigned it the office of keeping the firſt digeſted chyle, till that which was later taken into the ſtomach be digeſted; though if what Dr Wharton ſuggeſts, that there are lacteals at the bottom of the ſtomach, be true, ſuch a proviſion ſeems unneceſſary.

(1.) ANTWERP, a city formerly in the Auſtrian Netherlands, but now the capital of the new French department of Dieux Nattes. It lies in a low marſhy ground on the Scheldt, 24 miles N. from Bruſſels, 22 NE. of Ghent, and 65 S. of Amſterdam. Lon. 4. 15. E. Lat. 51. 12. N.

(2.) ANTWERP, BUILDINGS, STREETS, TRADE, &c. OF. This city is large and well built, containing 22 ſquares, and above 200 ſtreets, all ſtraight and broad, eſpecially that called the *Mere*, in which ſix coaches can go abreaſt. Moſt of the houſes are of freeſtone, and have an air of antiquity, being high, with courts before and gardens behind. At the head of the Mere is a crucifix of braſs 33 feet high. The cathedral dedicated to the Virgin Mary, the ſtadt-houſe, and the exchange, are magnificent ſtructures: the latter is the firſt building of that kind in Europe, and on its model the exchanges of London and Amſterdam are built. Its pillars are all of blue marble, and carved, but each in a different manner. The exchange coſt 300,000 crowns. Antwerp, towards the end of the 15th century, was a very flouriſhing town. The Scheldt, on which it ſtands, being 20 feet at low water, and riſing 20 feet more at flood, ſhips of the greateſt burden came up to the keys, as in the river Thames at London; but when the United Provinces formed themſelves into a free ſtate, after having ſhaken off the yoke of Spain, they got the entire command of the navigation of the Scheldt; which ruined the trade of Antwerp, and transferred it to Amſterdam. This made the inhabitants turn to painting, jewelling, and banking, which they have continued to this day with great ſucceſs and reputation: for at Antwerp bills of exchange may be negociated for any ſum to any part of Europe; and in the time of Queen Anne's wars, two brothers of the name of De Koning, paid the one the army of France, and the other that of the confederates. Antwerp has alſo a fine manufacture of tapeſtry and lace; and, for the promoting of trade, an inſurance company has been erected. This city is the ſee of a biſhop, who, as abbot of St Bernard, is the ſecond prelate in Brabant. The biſhopric is of great extent, and the cathedral a moſt noble pile, with one of the fineſt ſteeples in the world. The emperor Charles V. when he made his entry into Antwerp, ſaid it ought to be put in a caſe, and ſhowed only once a year for a rarity. The houſe of Hanſtowns, built when the city was in its flouriſhing condition, is a ſtately building, with magazines above for dry goods, and cellars below for wet, and in the middle ſtory were 300 lodging-rooms for merchants; but now it is turned to a horſe barrack. There is a market held every Friday, where all ſorts of houſehold goods, pictures, and jewels, are ſold by auction. No city in the Netherlands has ſo many and ſo fine churches as this. Many of them, particularly the cathedral and Jeſuit's church, are adorned with paintings, by Sir Peter Paul Rubens, who was a native of this city; and by Quintin Maſſeys, who is ſaid to have been a blackſmith; but having fallen in love with a painter's daughter, and been told by her father, when he aſked her of him in marriage, that he would have none but a painter for his ſon-in-law, he went to Italy to ſtudy painting, and, in a few years, returned ſo eminent in his new profeſſion,

profeſſion, that he found no difficulty in obtaining the father's conſent. He is interred at the entry of the cathedral, where his effigy is put up, with an inſcription, ſignifying, that conjugal love made an *Apelles* of a blackſmith. The above-mentioned Jeſuits church is extremely magnificent, and the chapel of the Virgin, joining to it, ſtill more ſo. Among the cloiſters the moſt remarkable are, the noble and rich abbey of St Michael, on the banks of the Scheldt, the apartments of which are truly royal, and in which all ſovereign princes that paſs this way actually lodge; and the Engliſh nunnery, of the order of St Thereſa, the nuns of which lie upon ſtraw, and never wear linen, nor eat fleſh; the grates of the convent are ſo diſmal, that it looks like a priſon. The city is environed with a fine wall, planted with rows of trees on each ſide, with walks between, broad enough for two coaches to go abreaſt; and is alſo defended by a very ſtrong, large, regular citadel, in form of a pentagon, erected by the Duke of Alva, in 1568, which commands the town and the neighbouring country. The magiſtracy of this city is choſen only out of the 7 patrician families; and conſiſts of two burgomaſters and 18 echevins, beſides inferior magiſtrates. Among the privileges granted to it by its princes, there is one by which every native is a citizen, though both his father and mother were foreigners.

(3.) ANTWERP, HISTORY OF. In 1585, Antwerp underwent a remarkable ſiege by the Duke of Parma. It was then the moſt wealthy city in the Netherlands, and had long been the object of his deſigns; but the difficulties attending the enterprize obliged him to poſtpone it for a conſiderable time. In order to ſucceed, it was neceſſary to cut off the communication of the city with Holland, Ghent, and all places above and below Antwerp on the Scheldt. To effect this, he laid ſiege to Liſkenſhouſt and Tillo, places of the utmoſt conſequence to the ſecurity and commerce of the city: both were obſtinately defended; and the ſiege of the latter was raiſed, after it had been carried on for 3 months: however, the Duke gained ſeveral other poſts on the river, where he built forts and greatly annoyed the ſhipping and trade of the city. He next laid ſiege to Dendermonde, in order to cut off the communication with Ghent, in which he ſucceeded by the reduction of the town. His next attempt was on Vilvorde: this place he took by aſſault, and thereby cut off the communication with Bruſſels. Finding, however, this method of hemming in the city tedious, and ineffectual while an opening to the mouth of the river remained, he formed a deſign of building a bridge acroſs the Scheldt, the extremities of which were to be defended by ſtrong forts and outworks.—He began with collecting great quantities of wood at Callo and fort St Philip, where he intended the bridge ſhould be built; but his project was for ſome time retarded by the Antwerpers, who broke down the dykes, overflowed the whole country, and carried off his magazines by the inundation. Not diſcouraged by this loſs, he applied himſelf diligently to repair it, and with incredible expedition cut out a canal from Steken to Callo, by which he carried off the waters. He then ſet to work upon the bridge, and finiſhed it in ſeven months, without any interruption from the Zealanders. During the building of this bridge, Aldergone, governor of Antwerp, propoſed to build a fort on Convenſteyn dyke, in order to ſecure that important poſt, and then breaking down the dyke when the bridge was near finiſhed: but he was violently oppoſed by certain citizens, who apprehended that their lands and villas would be deſtroyed by the inundation. This unſeaſonable oppoſition, with the negligence of the magiſtrates, who, becauſe the markets were high, had not laid in a ſufficient ſtock of corn, occaſioned the loſs of the city. However, in deſpite of all the Duke of Parma's precautions, the Zealanders found means to throw in a convoy of corn; but the citizens, knowing they would not run the riſk of carrying it back again, ſo cheapened the price, that theſe bold traders refuſed ever to bring their goods again to ſo bad a market. The Antwerpers, having thus through avarice brought on their ruin, began in a ſhort time to ſuffer by famine; they then preſſed the Zealanders to attempt ſomething for their relief, but it was now too late. While the magiſtrates were deliberating on ſome means for deſtroying the bridge, which they might have prevented from being ever completed, one Ginebelli, a Mantuan engineer, offered his ſervices, undertaking at a certain expence to blow it into the air. Even in this extremity the expence was grudged: but neceſſity at laſt overcame this obſtacle; Ginebelli was furniſhed with two large veſſels, a number of ſmall boats, and every thing neceſſary. He formed the two large veſſels into fire ſhips, which he ſet a-drift with the ſtream, deceiving the enemies by means of falſe fires lighted up in the fleet of ſmall boats. The train of one of the fire-ſhips was expended before the time expected, and ſhe blew up with a terrible exploſion, but with little damage to the bridge. The other was more ſucceſsful, carrying off all the out-works, ſetting fire to the whole bridge, and burying about 500 ſoldiers in the ruins it made. The fire, however, was ſoon extinguiſhed, and the bridge repaired by the Duke of Parma, while the Antwerpers were prevented by avarice from repeating the experiment; ſo that they were ſoon reduced to the greateſt ſtraits and obliged to ſurrender. It is ſaid that the city of Amſterdam had obſtructed every meaſure for the relief of Antwerp, hoping to profit by its deſtruction. It was not doubted but the Proteſtants would forſake it as ſoon as it fell into the hands of an arbitrary Catholic prince; and this conjecture was ſoon fulfilled by the removal of many families with their effects to Amſterdam.—After the battle of Ramillies, the city of Antwerp ſurrendered to the Duke of Marlborough. It was taken by the French in 1746, but reſtored to the houſe of Auſtria at the treaty of Aix-la-Chapelle. It was retaken by the French republican army in July 1794, along with the reſt of the Auſtrian Netherlands; the Duke of York being obliged to abandon the defence of it, after the defeat of the Prince of Cobourg, and his retreat towards Maſtricht.

ANTYLION, in the ancient pharmacy, a kind of aſtringent amalgam, deſcribed by Aëtius.

ANTYX, [from ἀντύξ,] in antiquity, the outermoſt round or circumference of a ſhield.

(I. 1.) ANUBIS, a ſymbolical deity of the Egyptians, generally repreſented in the form of a man with a dog's head, bearing a branch of palm in one hand, and a caduceus in the other, was regarded as the faithful companion of Oſiris and of Iſis. Temples and prieſts were conſecrated to him, and his image was borne in all religious ceremonies. Cynopolis, the preſent Mineh, ſituated in the lower Thebais, was built in honour of Anubis. The temple wherein he was worſhipped no longer ſubſiſts. The prieſts celebrated his feſtivals there with great pomp, and conſecrated the dog to him as the living repreſentation. "Anubis, ſays Strabo, is the city of dogs, the capital of the Cynopolitan prefecture. Theſe animals are fed there on ſacred aliments, and religion has decreed them a worſhip." An event, however, related by Plutarch, brought them into conſiderable diſcredit with the people. Cambyſes having ſlain the god Apis, and thrown his body into a field, all animals reſpected it except the dogs, which alone eat of his fleſh. This impiety diminiſhed the popular veneration! Cynopolis was not the only city which burned incenſe on the altars of Anubis. He had chapels in almoſt all the temples. On ſolemnities, his image always accompanied thoſe of Iſis and Oſiris. Rome having adopted the ceremonies of Egypt, the emperor Commodus, to celebrate the Iſiac feaſts, ſhaved his head, and himſelf carried the god Anubis. The ſtatue of this god was either maſſive gold or gilt, as well as the attributes that accompanied him. Anubis ſignifies gilded. The denomination was myſterious: and the Egyptian prieſts had not given it without reaſon. See § 2.

(2.) ANUBIS, THE FABLE OF, EXPLAINED. The ſignification of this emblematical deity is thus explained by Plutarch: "The circle which touches and ſeparates the two hemiſpheres, and which is the cauſe of this diviſion, receiving the name of horizon, is called Anubis. He is repreſented under the form of a dog, becauſe that animal watches day and night." St Clemens of Alexandria, who was well informed in the myſtic theology of the Egyptians, favours this explication. The two dogs, ſays he, (the two Anubes) are the ſymbols of two hemiſpheres which environ the terreſtrial globe. He adds in another place: Others pretend that theſe animals, the faithful guardians of men, indicate the trophies, which guard the ſun on the S. and N. like porters. According to the former of theſe interpretations, the prieſts, regarding Anubis as the horizon, gilded his ſtatue; to mark, that this circle, receiving the firſt rays of the ſun, appears ſparkling with brightneſs on his riſing, and that at his ſetting he reflects his laſt rays upon the earth. They ſaid in their ſacred fables, that Anubis was the ſon of Oſiris, but illegitimate. In fact, he only gives to the earth a borrowed light; and cannot be eſteemed, like Horus, as the father of the day, or as the legitimate offspring of Oſiris. It may be added, that the viſible horizon turning with the ſun, is his inſeparable companion. In the latter of theſe explications, where Anubis repreſents the tropics, he is alſo the faithful guardian of Iſis and Oſiris. In fact, the courſe of the ſun and of the moon is contained between the circles wherein the ſolſtices are performed. They neither deviate to the right nor left. Theſe limits aſſigned by the author of nature might therefore, in hieroglyphic language, be repreſented by a divinity with the head of a dog, who ſeemed to oppoſe their paſſage on the ſide of the two poles. The other opinion, notwithſtanding, ſeems more natural, and to be more analogous to the ideas of the prieſts. Upon the whole it would ſeem, that Anubis at firſt was only a ſymbolical image, invented by aſtronomers to give a ſenſible expreſſion of their diſcoveries; that afterwards, the people, accuſtomed to ſee it in their temples, which were the depoſitories of ſcience, adored it as a deity; and that the prieſts favoured their ignorance by connecting it with their religion. The worſhip of Anubis, introduced that of the dog, as his emblem. Perhaps many of the gods of the Gentiles originated in this manner.

(II.) ANUBIS, in geography, a city of Egypt. See ANUBIS, No. I.

ANVEILER, a town of France, in the department of the Lower Rhine, ſeated on the Quich, above Landau.

ANVERS-LE-HAMON, a town of France in the department of Sarte. Lon. 0. 29. E. Lat. 47. 43 N.

(1.) * ANVIL. *n. ſ.* [*anville*, Sax.] 1. The iron block on which the ſmith lays his metal to be forged.—

I ſaw a ſmith ſtand with his hammer, thus,
The whilſt his iron did on his *anvil* cool. *Shak.*

2. Any thing on which blows are laid.—

Here I clip
The *anvil* of my ſword, and do conteſt
Hotly and nobly. *Shakeſpeare.*

3. Figuratively; to be upon the *anvil*, is to be in a ſtate of formation or preparation.—Several members of our houſe knowing what was upon the *anvil*, went to the clergy, and deſired their judgement. *Swift.*

(2.) ANVIL DESCRIBED. The face or upper ſurface muſt be very flat and ſmooth, without flaws, and ſo hard that a file will not touch it. At one end there is ſometimes a pike, bickern, or beak-iron, for the rounding of hollow work. The whole is uſually mounted on a firm wooden block. —Forged anvils are better than thoſe of caſt work, and the beſt have the upper part made of ſteel.—Lockſmiths have a ſmaller kind of anvil called the *ſtake*, which is moveable, and placed ordinarily on their work-bench. Its uſe is for ſetting ſmall cold work ſtraight, or to cut or punch on with the cold chiſſel or cold punch.

ANVILLE, John Baptiſte Bourguignone d', geographer to the king of France, was born at Paris in 1697. He was a moſt induſtrious ſtudent; and it is ſaid he laboured 15 hours every day for 50 years, in the improvement of geography. He died in Jan. 1782. His maps are highly eſteemed, and his works are all valuable. They are as follow: 1. A Diſſertation on the Extent of the ancient Jeruſalem: 2. Some particulars of ancient Gaul, drawn from the Remains of the Romans: 3. On ancient and modern Egypt, with a Deſcription of the Arabian Gulph: 4. An Abridgment of ancient Geography, 3 vols.: 5. A Treatiſe on Itinerary Meaſures, ancient and modern: 6. The governments formed in Europe after the Fall of the Roman Empire.

(I.) ANUS, in anatomy, the lower extremity of the

the inteſtinum rectum, or orifice of the fundament. See ANATOMY, INDEX. Alſo a ſmall hole in the third ventricle of the brain.

(1.) ANUS, DISEASES OF THE, are a fiſtula, and the *procedentia* or *prolapſus ani*; to which may be added the hæmorrhoids, or piles.

(2.) ANUS, IMPERFORATED.—When children are born without an anus, it is very difficult to hit on the right part for making a perforation in the rectum, becauſe the extremity of the gut is generally formed into a knot. For performing ſuch a perforation, M. Petit recommends a trocar, the *canula* and circular plate of which are ſo ſlit open, as to ſerve as a groove for a biſtoury to be run in, to enlarge the aperture after the trocar has been puſhed into the gut.

(4.) ANUS, MUSCLES OF THE, are the *ſphincter*, *levator*, and *ſcalptor*, or *latiſſimus dorſi*.

(II.) ANUS, in botany, the poſterior opening of a monopetalous flower.

(III.) ANUS, in entomology, a ſpecies of *muſca* in the claſs of vermes.

ANWEALD, [Sax. *anwald*, a defender, Teut.] authority.

ANWEILER. See ANVEILER.

ANWICK, a pariſh in Lincolnſhire.

ANWICK in Northumberland. See ALNWICK.

ANXICANS. See ANSICANS.

ANXICO. See ANSIKO.

* ANXIETY. *n. ſ.* [*anxietas*, Lat.] 1. Trouble of mind about ſome future event; ſuſpenſe with uneaſineſs; perplexity; ſolicitude.—To be happy, is not only to be freed from the pains and diſeaſes of the body, but from *anxiety* and vexation of ſpirit; not only to enjoy the pleaſures of ſenſe, but peace of conſcience, and tranquillity of mind. *Tillotſon.* 2. In the medical language, lowneſs of ſpirits, with uneaſineſs of the ſtomach.—In *anxieties* which attend fevers, when the cold fit is over, a warmer regimen may be allowed; and becauſe *anxietics* often happen by ſpaſms from wind, ſpices are uſeful. *Arbuthnot.*

ANXIFEROUS. *adj.* cauſing anxiety.

* ANXIOUS. *adj.* [*anxius*, Lat.] 1. Diſturbed about ſome uncertain event; ſolicitous; being in painful ſuſpenſe; painfully uncertain.—

With beating hearts the dire event they wait,
Anxious, and trembling for the birth of fate. *Pope.*

2. Careful; full of inquietude; unquiet.—

In youth alone, unhappy mortals live;
But ah! the mighty bliſs is fugitive;
Diſcolour'd ſickneſs, *anxious* labour come,
And age, and death's inexorable doom. *Dryden.*

3. Careful, as of a thing of great importance.—No writings we need to be ſolicitous about the meaning of, but thoſe that contain truths we are to believe, or laws we are to obey; we may be leſs *anxious about* the ſenſe of other authors. *Locke.* 2. It has generally *for* or *about* before the object, but ſometimes *of*; leſs properly.—

Anxious of neglect, ſuſpecting change. *Granv.*

* ANXIOUSLY. *adv.* [from *anxious*.] In an anxious manner; ſolicitouſly; unquietly; carefully; with painful uncertainty.—But where the loſs is temporal, every probability of it needs not put us ſo *anxiouſly* to prevent it, ſince it might be repaired again. *South.*

* ANXIOUSNESS. *n. ſ.* [from *anxious*.] The quality of being anxious; ſuſceptibility of anxiety.

ANXUR, in ancient geography, a city of the Volſci, in Latium; called *Tarracina*, by the Greeks and Latins: Now, *Terracina*; ſituated on an eminence. Lon. 14. 5. E. Lat. 41. 18.

ANXURAS, a citizen of Anxur.

ANXURUS, AXURUS, or AXYRUS, epithets of Jupiter, worſhipped at Anxur, without a beard.

(1.) ANY, a ſmall town of Ireland, 12 miles S. E. of Limerick, in the province of Munſter.

(2.) * ANY. *adj.* [*anig*, *enig*, Sax.] 1. Every; whoever he be; whatever it be. It is, in all its ſenſes applied indifferently to perſons or things.—I know you are now, Sir, a gentleman born—Ay, and have been ſo *any* time theſe four hours. *Shakeſpeare.* 2. Whoſever; whatſoever; as diſtinguiſhed from ſome other.—An inverted motion being begun *any* where below, continues itſelf all the whole length. *Locke.* 3. It is uſed in oppoſition to *none*.—I wound and I heal: neither is there *any* that can deliver out of my hand. *Deut.* xxxii. 39.

ANXERMA, 1. a province of S. America, where there are gold mines: 2. a town in that province, ſeated on the Coca. Lon. 75. 25. W. Lat. 4 58.

ANZI, a ſmall town in Naples.

ANZICANS. See ANSICANS.

ANZICO See ANSIKO.

AO. a Gaelic adverb, ſignifying *not*, and prefixed to words in that language, like the *a* privative of the Greek, to which the Gaelic has no ſmall affinity, in many other inſtances.

AONIAN MOUNT, the hill Parnaſſus, fabled to have been the reſidence of the Muſes.

AONIDES, in mythology, one of the many appellations of the Muſes; ſo called from AONIA.

AORASIA, (from *a* negative, and ὁράω, to ſee,) in antiquity, the inviſibility of the gods. The opinion of the ancients with regard to the appearance of the gods to men, was, that they never ſhowed themſelves face to face, but were known from their backs as they withdrew. Neptune aſſumed the form of Calchas to ſpeak to the two Ajaxes; but they knew him not till he turned his back to leave them, and diſcovered the god by his majeſtic ſtep as he went from them. Venus appeared to Æneas in the character of a huntreſs: but her ſon knew her not till ſhe departed from him; her divinity was then betrayed by her radiant head, her flowing robe, and her majeſtic pace.

AOREIDH, (Gaelic, not ſmooth,) a rapid river in Argyllſhire, upon which Inverary is ſeated, and from which, Mr Paul Fraſer, the miniſter, traces the origin of the name of that town.

(1.) * AORIST. *n. ſ.* [ἀόριστος] Indefinite; a term in the Greek grammar.

(2. AORIST, among grammarians, (from *a*, negative, and ὁρίζω, to limit, a tenſe peculiar to the Greek language, comprehending all the tenſes; or rather expreſſing an action in an indeterminate manner, without any regard to paſt, preſent, or future.

AORISTIA, in the ſceptic philoſophy, denotes that ſtate of the mind wherein we neither aſſert nor deny any thing poſitively, but only ſpeak of things as ſeeming or appearing to us in ſuch a man-

a manner. The aoriſtia is one of the great points or terms of ſcepticiſm, to which the philoſophers of that denomination had continual recourſe by way of explication, or ſubterfuge. Their adverſaries, the Dogmatiſts, charged them, however, with dogmatizing, by aſſerting the principles and poſitions of their own ſect to be *true* and *certain*.

(1.) AORNUS, a high rock of India, which has its name from its extraordinary height, as being above the flight of a bird. Its circuit was about 8 miles, its height 11 furlongs, and the way leading up to the top artificial and narrow. At the bottom, on one ſide, ran the river Indus; on the top was a fine plain, part of which was covered with a thick wood; the reſt arable land, with a fountain furniſhing abundance of excellent water. This rock was taken by Alexander the Great, in whoſe time there was a report that Hercules had attempted it in vain; however, according to Arian, this report was without foundation. It is probable indeed, that it was raiſed after the place was taken, in order to magnify Alexander's exploit. While the Macedonian monarch was preparing all things neceſſary for the ſiege, an old man with his two ſons, who had long lived in a cave near the ſummit, came and offered to ſhow him a private way of aſcending. This being readily accepted, Ptolemy, with a conſiderable body of light armed troops, was diſpatched with them, with orders in caſe they ſucceeded, to entrench themſelves ſtrongly upon the rock in the wood to which the old man was to direct them, before they ventured to attack the Indians. Ptolemy exactly executed his orders; and gave notice, by a lighted torch ſet upon a pole, that he had got ſafely up. Upon this, Alexander gave immediate orders for a body of troops to attempt the paſſage by which the rock was commonly aſcended; but they were repulſed with great ſlaughter. He then ſent an Indian with letters to Ptolemy, deſiring him, the next time an attack was made by the common way, to fall upon the enemy behind. But in the mean time, thoſe who defended the rock attacked Ptolemy with great vigour; but were at laſt repulſed, though with much difficulty: but the next day, when Alexander renewed the attack, though Ptolemy attacked the Indians in the rear, the Macedonians were repulſed on both ſides. At laſt the king, perceiving that the ſtrength of the Indians lay in the ſtraitneſs and declivity of the way by which they were attacked, cauſed a great quantity of trees to be felled, and with them filled the cavities between the plain on which the Indians were encamped and the higheſt of his own advanced poſts. The Indians at firſt derided his undertaking; but at length perceiving the ardour with which the work was carried on, and having felt the effects of the miſſile weapons of the Macedonians, they ſent deputies to propoſe terms of capitulation. Alexander, ſuſpecting that their deſign was only to amuſe him till they made their eſcape, withdrew his guards from the avenues. As ſoon as he knew the Indians were deſcended, he, with 700 of Ptolemy's light-armed foot, took poſſeſſion of the deſerted rock, and then made a ſignal for his forces to fall upon the flying Indians. They ſetting up a loud ſhout, ſo terrified the fugitives, that numbers of them fell from the rocks and precipices, and were daſhed to pieces, while the greateſt part of the remainder were cut off in the roads.

(2.) AORNUS, a poiſonous lake of Campania, called alſo AVERNUS, which ſee.

(1.) * AORTA. *n. ſ.* [ἀορτη.] The great artery which riſes immediately out of the left ventricle of the heart. *Quincy.*

(2.) AORTA is divided into two grand trunks, diſtinguiſhed by the epithets *aſcending* and *deſcending*. See ANATOMY, INDEX.

(1.) AOST, AOUST or AOUSTA, } a territory of Piedmont, which has the title of a duchy. It is a valley 30 miles in length, and extends from the paſs of St Martin's, near the frontiers of Yvree, to St Bernard. It abounds in paſtures, and all ſorts of fruits.

(2.) AOUSTA, or AOST, a town of Italy, in Piedmont, the capital of the above diſtrict, (N° 1.) a biſhop's ſee, and ſubject to the king of Sardinia. It is remarkable for ſeveral monuments of the Romans, and for the birth of Anſelm, archbiſhop of Canterbury. It is ſeated at the foot of the Alps, on the river Doria. Lon. 7. 33. E. Lat. 45. 38. N.

AOUTA, the name of the paper mulberry tree at Otaheite, in the South Sea, from which a cloth is manufactured, that is worn by the principal inhabitants. The bark of the trees is ſtripped off and depoſited to ſoak in running water; when it is ſufficiently ſoftened, the fibres of the inner coat are carefully ſeparated from the reſt of the bark; they are then placed in lengths of about 11 or 12 yards, one by the ſide of another, till they are about a foot broad; and two or three layers are laid one upon the other. This is done in the evening: and next morning the water is drained off, and the ſeveral fibres adhere together in one piece. It is afterwards beaten on a ſmooth piece of wood with inſtruments marked lengthways, with ſmall grooves of different degrees of fineneſs; and by means of this becomes as thin as muſlin. After bleaching it in the air, to whiten it, it is fit for uſe. If the cloth breaks in the beating, it is eaſily repaired by paſting on a patch with a glutten that is prepared from the root of the *pea*, which is done ſo nicely that it cannot be diſcovered. This cloth is cool and ſoft, but as liable to be rent as paper. The colours with which it is dyed are principally red and yellow. The red is a beautiful ſcarlet, and produced by mixing the juices of two vegetables, viz. the fruit of the fig called *matle*, and the leaves of the *cordia ſebeſtina*, or *etou*. The yellow is made of the bark of the root of the *ſ rinda citrifolia*, called *nono*, by ſcraping and infuſing it in water. The inhabitants of the iſland alſo dye yellow with the fruit of the *tamanu*.

* APACE. *adv.* [from *a* and *pace*; that is, with a great pace.] 1. Quick; ſpeedily: uſed of things in motion.—

Or when the flying libbard ſhe did chace,
She could then nimbly move, and after fly *apace*.
Spenſer.

2. With haſte; applied to ſome action.—

The baron now his diamonds pours *apace*;
Th' embroider'd king, who ſhows but half his face,
And his refulgent queen. *Pope's Rape of the Lock.*

3. Haſtily;

3. Haſtily; with ſpeed: ſpoken of any kind of progreſſion from one ſtate to another.—

This ſecond courſe of men
With ſome regard to what is juſt and right,
Shall lead their lives, and multiply *apace*. *Milton.*

APACHES, } a people of New Mexico in North
APACHI, } America. They are brave, reſolute, and warlike, fond of liberty, and the inveterate enemies of tyranny and oppreſſion. Of this diſpoſition the Spaniards had fatal experience towards the end of the laſt century, when they revolted againſt the Catholic king, maſſacred ſeveral of his officers, and committed the greateſt deva-ſtations. Ever ſince, they have remained the allies, not the ſubjects, of the Spaniards; and the viceroy of Mexico has been obliged to maintain a more formidable garriſon, and a greater number of troops.

APACTIS, in botany, a genus of the dodecandria monogynia claſs and order. The eſſential character is, corolla four-petalled: calyx none. There is only one ſpecies, a tall tree, a native of Japan.

APÆDEUTÆ, illiterate perſons. This term was particularly uſed among the French in the time of Huet: when the men of wit at Paris were divided into two factions, one called by way of reproach, *apædeutæ*, and the other *eruditi*. The apedeutæ are repreſented by Huet, as perſons who, finding themſelves either incapable or unwilling to undergo a ſevere courſe of ſtudy, in order to become truly learned, conſpired to decry learning, and turn the knowledge of antiquity into ridicule, thus making a merit of their own incapacity. The apedeutæ, in fact, were the men of pleaſure; the eruditi the men of ſtudy. The apedeutæ preferred the modern writers to the ancient, to ſave themſelves the trouble of ſtudying the latter. The eruditi derided the moderns, and valued themſelves wholly on their acquaintance with the ancients. Neither party were entirely in the right.

APÆDUSIA, [from *α*, and *παιδια*, inſtruction,] ignorance or unſkilfulneſs in what relates to learning and the ſciences.

APAFALVA, a village in Tranſylvania.

APAGMA, a term uſed, by ſome writers in chirurgery, for the thruſting of a bone, or other part out of its proper place. But it is more properly uſed for a fracture of a bone at or near the part whereby it is articulated with another.

(1.) APAGOGE, [from *απο* and *αγω*, I bear,] in the ancient Athenian law, the carrying a criminal taken in the fact, to the magiſtrate. If the accuſer was not able to bring him to the magiſtrate, it was uſual to take the magiſtrate along with him to the houſe where the criminal lay concealed, or defended himſelf.

(2.) APAGOGE, in logic. See ABDUCTION.

(3.) APAGOGE, in mathematics, is ſometimes uſed to denote a progreſs or paſſage from one propoſition to another; when the firſt having been once demonſtrated, is afterwards employed in the proving of others.

* APOGOGICAL. *adj.* [from *απαγωγη*; compounded of *απο*, from, and *αγω*, to bring or draw.] An *apogogical* demonſtration is ſuch as does not prove the thing directly; but ſhews the impoſſibility, or abſurdity, which ariſes from denying it; and is alſo called *reductio ad impoſſibile*, or *ad abſurdum*. *Chambers.*

APAID, paid. *Chauc.*

To APAIR. *v. a.* To impair. *Chauc.*

APALACHE, a river in Florida.

APALACHES, } a nation of Indians in Flo-
APALACHI, } ri-

APALACHIAN MOUNTAINS, more properly called the ALLEGANY MOUNTAINS, have their ſouthern beginning near the bay of Mexico, in the latitude of 30°, extending northerly on the back of the Britiſh colonies, and running parallel with the ſea coaſt to the latitude of 40° N. but their diſtance from the ſea, on the W. is not exactly known, though it is generally thought to be about 200 miles. A great part of theſe mountains is covered with rocks, ſome of which are of a ſtupenduous height and bulk; the ſoil between them is generally black and ſandy, but in ſome places differently coloured, and compoſed of pieces of broken rock and ſpar, of a glittering appearance, which ſeem to be indications of minerals and ores, if proper ſearch was made for them. Cheſnuts and ſmall oaks are the trees that principally grow on theſe mountains, with ſome *chinkapin* (or FAGUS PUMILA, which ſee,) and other ſmall ſhrubs. The graſs is thin, mixed with vetch and ſmall peaſe; and in ſome places there is very little vegetable appearance. The rocks of the Apalachian mountains ſeem to engroſs one half of the ſurface. They are moſtly of a light grey colour: ſome are of a coarſe-grained marble like alabaſter; others of a metallic luſtre; ſome pieces are in the form of ſlate, and brittle; others in lumps, and hard: and ſome appear with ſpangles, or covered over with innumerable ſmall ſhining ſpecks, like ſilver. Theſe frequently appear at the roots of trees where blown down. The different ſpars are found moſt on the higheſt and ſteepeſt parts of the hills, where there is little graſs and few trees; but the greateſt part of the ſoil between the rocks is generally a dark ſandy coloured kind of mould, and ſhallow; yet fertile, and productive of good corn, which encourages the Tallipooſes, a clan of the Cherokee Indians, to ſettle among them in latitude 34°: and they are the only Indian nation that has a conſtant reſidence upon theſe mountains. See ALLEGANY and AMERICA, § 8 and 42.

APALACHICOLA, a river of North America.

APALACHINE, in botany, a name given by ſome authors to the ſhrub *caſſine vera Floridarum* of other writers. This plant is uſed as tea, and celebrated for many virtues.

APALACHTY-COLA, a harbour in Florida.

APALOOSA, a river in North America.

APAMA, the wife of Pruſias and mother of Nicomedes, kings of Bithynia.

APAMÆI, or } the inhabitants of APAMEA,
APAMENI, } N° 1.

APAME, the daughter of Artabazus, the Perſian, wife of Seleucus Nicator, and mother of Antiochus Soter, kings of Syria.

(1.) APAMEA, or APAMIA, a city of Bithynia, formerly called *Myrlea*, from Myrlus, general of the Colophonians: deſtroyed by Philip VI. king of Macedon, and given to his ally Pruſias, who rebuilt it, and called it *Apamea*, from the name of his queen Apama. Stephanus ſays, that Memnon

dus Epiphanes, ſon of Pruſias, called it after his mother; and that it had its ancient name from Myrlea, an Amazon. The Romans led a colony thither, called *Colonea Apamena*.

(2.) APAMEA, called alſo CIBOTOS, a city of Phrygia, ſeated at ſome diſtance from the Meander, or, as would ſeem from a coin of Tiberius, on the Meander; ſo named from Apame, the daughter of Artabazus. The riſe, or at leaſt the increaſe of Apamea, was owing to the ruins of Celenæ. See APAMIENSES.

(3.) APAMEA, now called FAMIA, a ſtrong city of Syria, below the confluence of the Orontes and Marſyas; ſituated in a peninſula, formed by the Orontes and a lake. "It was here, ſays Strabo, that the Seleucidæ had eſtabliſhed the ſchool and nurſery of their cavalry." The ſoil of the neighbourhood, abounding in paſturage, fed no leſs than 30,000 mares, 300 ſtallions, and 500 elephants; inſtead of which, the marſhes of Famia at preſent ſcarcely afford a few buffaloes and ſheep. To the veteran ſoldiers of Alexander, who here repoſed after their victories, have ſucceeded wretched peaſants, who live in perpetual dread of the oppreſſions of the Turks and the inroads of the Arabs. Such are the effects of deſpotiſm and ignorance.

(4—7.) APAMEA, or APAMIA, } was alſo the name of ſeveral other ancient cities: viz. 4. It was the ancient name of Pella in Decapolis: 5. of a town on the confines of Media and Parthia, ſurnamed *Raphanæ*: 6. a town of Meſne, an iſland in the Tigris, where a branch of the Euphrates, called the *Royal River*, falls into the Tigris; and 7. a town in Meſopotamia, on the other ſide the Euphrates, oppoſite Zeugma on this ſide, both founded by Seleucus, and joined by a bridge, from which the latter takes its name.

APAMIENSES, the inhabitants of APAMEA, (N° 2.) Though it was an inland city, they were worſhippers of Neptune. The reaſon, it has been conjectured, was, that they had ſuffered often from earthquakes, of which he was ſuppoſed the author. Mithridates gave an hundred talents toward the reſtoration of the city; which, it is ſaid, had likewiſe been overthrown in the time of Alexander. Their tribute money was remitted to them for five years on the ſame account under the emperor Tiberius. The ſubterraneous paſſage of the Lycus and the other ſtreams ſhowed that the ground had many cavities: and theſe, it has been ſurmiſed, rendered the region very liable to be ſhaken.

APANAGE, or APENNAGE, in the ci-devant French cuſtoms, lands aſſigned by a ſovereign for the ſubſiſtence of his younger ſons, which reverted to the crown upon the failure of male iſſue in that branch to which the lands were granted.

APANOMIA, a town of Santorin, an iſland in the Mediterranean Sea, called in this part, by ſome, the *Sea of Candia*: it has a ſpacious harbour in the form of a half moon; but the bottom is ſo deep that ſhips cannot anchor there. Lon. 25. 59. E. Lat. 36. 18. N.

APANTA, a province of S. America, near the Amazon.

APANTHROPY, in medicine, denotes a love of ſolitude, and averſion for the company of mankind. Apanthropy is by ſome reckoned among the ſymptoms, by others among the ſpecies or degrees of melancholy; and alſo paſſes for an ill indication in leucophlegmatic caſes.

APARGIA, a genus of the claſs and order ſyngeneſia polygamia æqualis. The eſſential character is, calyx ſubimbricate, with linear, parallel, unequal ſcales; down plumoſe, ſubtiſſile; receptacle naked, ſubvilloſe. There are ſeven ſpecies, ſo much reſembling the dandelion, that they were formerly confounded.

APARIA, a province of S. America, near the Amazon.

APARINE, in botany, a ſynonime of the UTRICULARIA, and ſeveral other plants.

APARITHMESIS, (from ἀπαριθμέω, I number,) in rhetoric, is a figure, whereby that which might be expreſſed in few words is branched out into ſeveral particulars, to enlarge the idea and render it the more affecting; and ſometimes it denotes the anſwer to the *protaſis* or proportion itſelf. Thus if the *protaſis* be *appellandi tempus non erat*, the *aparithmeſis* is *at tecum anno plus vixi*.

* APART. *adv.* [*apart*, Fr.] 1. Separately from the reſt in place.—Since I enter into that queſtion, it behoveth me to give reaſon for my opinion, with circumſpection; becauſe I walk aſide, and in a way *apart* from the multitude. *Raleigh*.—The party diſcerned, that the Earl of Eſſex would never ſerve their turn, they reſolved to have another army *apart*, that ſhould be at their devotion. *Clarendon*. 2. In a ſtate of diſtinction; as, to ſet *apart* for any uſe.—He is ſo very figurative, that he requires a grammar *apart*, to conſtrue him. *Dryden*. 3. Diſtinctly.—Moſes firſt nameth heaven and earth, putting waters in the third place, as comprehending waters in the word earth; but afterwards he nameth them *apart*. *Raleigh*. 4. At a diſtance; retired from the other company.—

So pleaſe you, madam,
To put *apart* theſe your attendants. *Shakeſ.*

APARTEMENUS, or APARTISMENUS, } in the ancient poetry, an appellation given to a verſe, which comprehended an entire ſenſe or ſentence in itſelf.

* APARTMENT. *n. ſ.* [*appartement*, Fr.] A part of the houſe alotted to the uſe of any particular perſon; a room; a ſet of rooms.—

A private gallery 'twixt th' *apartments* led,
Not to the foe yet known. *Sir J. Denham*.

(1.) *APATHY. *n. ſ.* [ἀ, not, and πάθος, feeling.] The quality of not feeling; exemption from paſſion; freedom from mental perturbation.—

Of good and evil much they argued then,
Paſſion, and *apathy*, and glory, and ſhame. *Milt.*

(2.) APATHY, among the ancient philoſophers, implied an utter privation of paſſion, and an inſenſibility of pain. The Stoics affected an entire apathy: they conſidered it as the higheſt wiſdom to enjoy a perfect calmneſs or tranquillity of mind, incapable of being ruffled by either pleaſure or pain. In the firſt ages of the church, the Chriſtians adopted the term *apathy* to expreſs a contempt of all earthly concerns; a ſtate of mortification, ſuch as the goſpel preſcribes. Clemens Alexandrinus, in particular, brought it exceedingly in vogue; thinking hereby to draw the philoſophers

to Chriſtianity, who aſpired after ſuch a ſublime pitch of virtue. Quietiſm is only apathy diſguiſed under the appearance of devotion.

APATIT, a mineral, divided by the German mineralogiſts, into two varieties, the cryſtalized and earthy. It is the phoſpholite of Kirwan.

APATURIA. [from απατη, fraud,] in antiquity, a ſolemn feaſt celebrated by the Athenians in honour of Bacchus. It is ſaid to have been inſtituted in memory of a fradulent victory obtained by Melanthus, king of Athens, over Xanthus, king of Boœtia, in a ſingle combat, which they agreed upon, to put an end to a debate between them relating to the frontiers of their countries. Hence Budæus calls it *feſtum deceptionis*, "the feaſt of deceit." Others tell us that the young Athenians were not admitted into the tribes on the third day of the apaturia, till their fathers had firſt ſworn, that they were their own children; and that, till that time, they were ſuppoſed, in ſome meaſure, to be without fathers, απατορες; whence the feaſt, ſay they, took its name. Xenophon, on the other hand, informs us, that the relations and friends met on this occaſion, and joined with the fathers of the young people who were to be received into the tribes; and that from this aſſembly the feaſt took its name: that in απατηρια, the α, far from being a privative, being here a conjunctive, ſignifies the ſame thing with αμα, *together*. This feaſt laſted four days; the firſt day, thoſe of the ſame tribe made merry together; and this they called δορπια. The ſecond day, which they called ανηρσεις, they ſacrificed to Jupiter and Minerva. The third day, which they called κουρεωτις, ſuch of their young men and maids as were of age were admitted into their tribes. The fourth day they called επιβδην.

APAULETERIA, in antiquity, a garment preſented by the bride to the bridegroom, on the 2d or 3d day of a marriage. See next article.

APAULIA, in antiquity, the third day of a marriage ſolemnity. It was thus called, becauſe the bride, returning to her father's houſe, did απαυλιζεσθαι το νυμφιω, lodge apart from the bridegroom. Some will have the apaulia to have been the ſecond day of the marriage, viz. that whereon the chief ceremony was performed; thus called by way of contradiſtinction from the firſt day, which was called προαυλια. On that day, whatever it was, the bride preſented her bridegroom with a garment, called απαυλιστηρια.

APAUME, in heraldry, a hand opened, and a full palm appearing, with the thumb and fingers extended. It is ſeen by the hand of Ulſter, borne by the baronet of England.

(1.) * APE. *n. ſ.* [*apa*, Icelandiſh.] 1. A kind of monkey remarkable for imitating what he ſees —I will be more newfangled than an *ape*, more giddy in my deſires than a monkey. *Shakeſpeare.* —Writers report, that the heart of an *ape* worn near the heart, comforteth the heart, and increaſeth audacity. It is true, that the *ape* is a merry and bold beaſt. *Bacon.* 2. An imitator; uſed generally in the bad ſenſe.—Julio Romano, who, had he himſelf eternity, and could put breath into his work, would beguile Nature of her cuſtom: ſo perfectly he is her *ape*. *Shakeſpeare.*

(2.) APE, in zoology, the general Engliſh name of a very numerous race of animals, comprehending *Apes* properly ſo called, or ſuch as want tails; and *Monkeys* and *Baboons*, or ſuch as have tails, the former *long*, and the other *ſhort* ones. See SIMIA.

(3.) APE, SEA, a name given by Steller to a marine animal which he ſaw on the coaſt of America, and thus deſcribes in his Hiſtory of Kamſchatka, p. 136. "The head appeared like that of a dog, with ſharp and upright ears, large eyes, and with both lips bearded: the body round and corpid; the thickeſt part near the head: the tail forked; the upper lobe the longeſt: the body covered with thick hair, grey on the back, reddiſh on the belly. It ſeemed deſtitute of feet. It was extremely wanton, and played a multitude of monkey tricks. It ſometimes ſwam on one ſide, ſometimes on the other ſide of the ſhip, and gazed at it with great admiration. It made ſo near an approach to the veſſel, as almoſt to be touched with a pole; but if any body moved, it inſtantly retired. It would often ſtand erect for a conſiderable ſpace, with one third of its body above water; then dart beneath the ſhip, and appear on the other ſide; and repeat the ſame thirty times together. It would frequently ariſe with a ſea plant, not unlike the bottle gourd, toſs it up, and catch it in its mouth, playing with it numberleſs fantaſtic tricks."

* *To* APE. *v. a.* [from *ape*.] To imitate, as an *ape* imitates human actions.—

Aping the foreigners in every dreſs,
Which, bought at greater coſt, becomes him leſs. *Dryden.*

Curſe on the ſtripling! how he *apes* his ſire!
Ambitiouſly ſententious. *Addiſon.*

* APEAK, or APEEK. *adv.* [probably from *a pique*.] In a poſture to pierce the ground.

APECHEMA, απεχημα, in medicine, the ſame with contraſiſſure.

APEDALE, a village in Staffordſhire, near Stone.

APEDIA, a ſpecies of ape.

APEE, one of the new Hebrides in the S. Sea, near Mallicolo. Lon. 168. 32. E. Lat. 16. 18. N.

APEIBA of the Braſilians. See SLOANEA.

APELEY, a village in Devonſhire, near Barnſtaple.

(1.) APELLA, among phyſicians, a name given to thoſe whoſe prepuce is either wanting or ſhrunk, ſo that it can no longer cover the glans. Many authors have ſuppoſed this ſenſe of the word *apella*, warranted from the paſſage in Horace, *credat Judæus Apella, non ego*. According to Salmaſius and others, *Apella* is the proper name of a certain Jew, and not an adjective ſignifying *circumciſed*. But an objection naturally ariſes, why ſhould the poet name this particular Jew?

(2.) APELLA, in zoology, a ſpecies of ape found in America.

(1.) APELLES, one of the moſt celebrated painters of antiquity. He was born in the iſle of Cos, and flouriſhed in the time of Alexander the Great, with whom he was in high favour. He executed a picture of this prince, holding a thunderbolt in his hand; a piece, finiſhed with ſo much ſkill and dexterity, that it uſed to be ſaid there were two Alexanders; one invincible, the

ſon

ſon of Philip; the other inimitable, the production of Apelles. Alexander gave him a remarkable proof of his regard; for, when he employed Apelles to draw Campaſpe, one of his miſtreſſes, having found that he had conceived an affection for her, he reſigned her to him; and it was from her that Apelles is ſaid to have drawn his Venus Anadyomene. One of Apelles's chief excellencies was, his making his pictures ſo exactly reſemble the perſons repreſented; inſomuch that the phyſiognomiſts are ſaid to have been able to form a judgment of the perſon's deſtiny, as readily from his portraits, as if they had ſeen the originals. But what is called *grace* was the characteriſtic of this artiſt. His pencil was ſo famous for drawing fine lines, that Protogenes diſcovered by a ſingle line, that Apelles had been at his houſe. Protogenes lived at Rhodes: Apelles ſailed thither, and went to his houſe with great eagerneſs, to ſee the works of an artiſt, who was known to him only by name. Protogenes was gone from home: but an old woman was left watching a large piece of canvas, which was fitted in a frame for painting. She told Apelles that Protogenes was gone out; and aſked him his name that ſhe might inform her maſter who had inquired for him. "Tell him," ſays Apelles, "he was enquired for by this perſon;"—at the ſame time, taking up a pencil, he drew on the canvas, a line of great delicacy. When Protogenes returned, the old woman acquainted him with what had happened. The artiſt, upon contemplating the fine ſtroke of the line, immediately pronounced that Apelles had been there; for ſo finiſhed a work could be produced by no other perſon. Protogenes, however, himſelf drew a finer line of another colour; and, as he was going away, ordered the old woman to ſhow that line to Apelles, if he came again; and ſay,—"This is the perſon for whom you are enquiring." Apelles returned, and ſaw the line: he would not for ſhame be overcome; and therefore, in a colour different from either of the former, he drew ſome lines ſo exquiſitely delicate, that it was utterly impoſſible for finer ſtrokes to be made. Protogenes now confeſſed the ſuperiority of Apelles, flew to the harbour in ſearch of him, and reſolved to leave the canvas with the lines on it, for the aſtoniſhment of future artiſts. Apelles ſhowed great liberality of mind towards Protogenes. With ideas enlarged by education and literature, he was incapable of harbouring little jealouſies of noble competitors; on the contrary, he was the firſt who made the works of Protogenes to be valued as they deſerved, among the Rhodians. He acknowledged that Protogenes was in ſome reſpects ſuperior to himſelf; but that in one particular himſelf excelled, viz. in knowing when to take his hand from the picture; an art which Protogenes had not yet learned, and therefore over worked his pieces. Apelles equally diſapproved of too elaborate diligence, or too haſty negligence, in execution. A ſtudied work of Protogenes he eſteemed leſs on the one account; and on the other, when a ſilly painter once brought him a picture and ſaid, "This I painted in a hurry,"—he replied, "Though you had not told me ſo, I perceive it was painted in haſte: but I wonder you could not execute more ſuch pieces in the ſame time." There are two ſtories related of Apelles, which ſhow him to be both an artiſt of modeſty in amending even trifling improprieties, when pointed out to him by competent judges; and alſo endued with ſelf confidence ſufficient to make him know the perfection and value of his own paintings. It was cuſtomary with Apelles to expoſe to public view the works which he had finiſhed, and to hide himſelf behind the picture, in order to hear the remarks paſſed on it by perſons who chanced to view it. He once overheard himſelf blamed by a ſhoemaker for a fault in the ſlippers of ſome picture: he corrected the fault which the man had noticed: but on the day following, the ſhoemaker began to animadvert on the leg; upon which, Apelles with ſome anger, looked out from behind the canvas, and bade him keep to his own province; "Ne ſutor ultra crepidam." It is well known, that Alexander forbade any one, beſides Apelles, to paint his portrait. We are not, however, to conclude from this, that Alexander was a more ſkilful judge of painting than he was of poetry. Like Auguſtus, he cheriſhed the fine arts, more from vanity than taſte. A remarkable proof is given of this prince's inability to diſcern merit, and of the painter's freedom in expreſſing the mortification he felt, when a work of his was not ſufficiently commended. "Alexander," ſays Ælian, "having viewed the picture of himſelf, which was at Epheſus, did not praiſe it as it deſerved. But, when a horſe was brought in, and neighed at ſeeing the figure of a horſe in the picture, as though it had been a real horſe; *O king!* (ſaid Apelles) *this horſe ſeems to be by far a better judge of painting than you.*" It happened more than once, that the horſes drawn by him, were miſtaken for real ones, by living horſes, which ſaw and neighed at the pictures. In finiſhing a drawing of this animal, a remarkable circumſtance is related of him. He had painted a horſe returning from battle, and had ſucceeded to his wiſhes, in deſcribing every other mark that could indicate a mettleſome ſteed, impatient of reſtraint; there was wanting nothing but a foam of a bloody hue, iſſuing from the mouth. He again and again endeavoured to expreſs this, but his attempts were unſucceſsful. At laſt, with vexation, he threw againſt the reigns of the horſe, a ſponge, which had in it many colours; a mixture of which coming out of the ſponge, and tinging the reins, produced the very effect deſired by the painter. The works of Apelles were all admired; but the moſt celebrated were the picture of Alexander in the temple of Diana at Epheſus, and that of Venus, emerging from the ſea. Alexander was drawn with thunder in his hand; and ſuch relief was produced by the chiaroſcuro in this piece, that the finger ſeemed to ſhoot forward, and the thunder-bolt to be out of the picture. His Venus Ἀναδυομένη was eſteemed the moſt exquiſite figure which the pencil could create: it is therefore extolled by the Roman poets Propertius and Ovid; and the poet of Sidon, Antipater, has left a Greek epigram on it, the following tranſlation of which we uſe the freedom to copy from the *Encycl. Brit.*

Graceful

Graceful, as from her natal ſea ſhe ſprings,
Venus the labour of Apelles view.
With preſſing hand her humid locks ſhe wrings,
While from her treſſes drips the frothy dew:
Ev'n Juno and Minerva now declare,
"No longer we contend whoſe form's moſt rare."

(2.) APELLES, a heretic, who flouriſhed about A. D. 178, and appears to have been half Manichee, half Sadducee; for he taught that there was a good and a bad principle, denied the reſurrection, and pretended that the prophets contradicted each other; and that Chriſt having received his body from the elements, left it diſſolved in the air, and aſcended into heaven without one!

APELLICON, a peripatetic philoſopher, to whom the world is in a great meaſure indebted for the works of Ariſtotle, he having purchaſed them at a very high price about ninety years before Chriſt. He brought his purchaſe from Scepſis to Athens, where he cauſed the M. SS. to be copied. They were afterwards ſeized by Sylla, and carried to Rome.

APELLITÆ, or APELYTES, } Chriſtian heretics, of the 2d century, the followers of APELLES. See N° 2.

APENE, [ἀφὴν, chariot,] in antiquity, a kind of chariot, wherein the images of the gods were carried in proceſſion on certain days, attended with a ſolemn pomp, ſongs, hymns, dancings, &c. The apene, or ſacred chariot of the Greeks, is called *tenſa*. It was very rich, made of ivory, or of ſilver, and variouſly decorated.

APENNAGE. See APANAGE.

APENNINUS, the APPENNINE, a mountain, or ridge of mountains, running through the middle of Italy, from NW. to SW. for 700 miles, in the form of a creſcent: beginning at the Alps in Liguria, or the Riviera de Genoa; and terminating at the ſtraits of Meſſana, or at Reggio, and the promontory Leucopetra; and ſeparating, as by a ridge, the Adriatic from the Tuſcan ſea. This mountain, though high, is greatly ſhort of the height of the Alps. Its name is Celtic, ſignifying a *high mountain*.

APENNIS, in ancient laws, a deed or inſtrument, made in favour of a perſon, who has loſt the title deed to his houſe or land by fire. In ſuch caſe, an aſſembly of the people of the neighbourhood being called, and an exact enquiry made before the judge, another inſtrument was framed, to confirm and ſecure the perſon's right.

APENRADE, a town of Denmark, in the duchy of Sleſwick, ſeated at the bottom of a gulph in the Baltic ſea, between Flenſbourg and Hadaſchleben, 25 miles N. from Sleſwick. Lon. 9. 28. E. Lat. 55. 4. N.

(1.) APENZEL, a canton of Switzerland, conſiſting of only 3 or 4 valleys; having the town and abbey of St Gall on the N. the county of Toggenburg on the W. the lordſhip of Sax in the canton of Zurich, on the S. and the Rheinthall or Rhine-valley, on the E. Its greateſt length is about 30 miles, and its breadth 20. It yields good paſturage, and conſequently is not deſtitute of cattle, milk, butter or cheeſe. Conſiderable quantities alſo of wheat, rye, barley, oats, beans, peaſe, flax, and wine, are produced in it; beſides a great deal of fruit, wood, and turf; with mineral waters, and warm baths. There are many mountains in the canton, the higheſt of which is the Hoheſantis, or the Hohe-Meſmer, which commands a proſpect of a prodigious extent. There are alſo ſeveral lakes and rivers. The inhabitants, who are partly Proteſtants, and partly Roman Catholics, ſubſiſt chiefly by their manufactures of linen, crape, fuſtian, and thread, or by bleaching, and the ſale of their cattle, butter, cheeſe, horſe, wood, and coal. Of the 23 pariſhes in the canton, 4 are Popiſh and 19 Proteſtant. Before the reformation, the inhabitants, were ſubject to the Abbot of St Gall; but they then ſhook of his yoke, and united themſelves with the other cantons in 1513. After that, however, there were violent animoſities between the Papiſts and Proteſtants, the former continually proſecuting the latter, till at laſt, in 1587, by the mediation of the other cantons, the two parties came to an accommodation, by which certain diſtricts were aſſigned to each party, whereas before they lived promiſcuouſly together; and though theſe two diviſions now conſtitute but one canton, yet each forms a diſtinct community or ſee ſtate, ſending its particular repreſentatives to the diets of the confederacy, and having its ſeparate councils and officers. In ſpirituals the Papiſts are ſubject to the biſhop of Conſtance, but the Proteſtants to their own conſiſtory. The militia of the former does not exceed 300, whereas thoſe of the latter amounts to 10,000.

(2.) APENZEL, a town of Switzerland, the capital of the canton, N° 1. ſeated on the river Chuz, 25 m. S. of Conſtance. Lon. 9. 1. E. Lat. 47. 31. N.

(1.) * APEPSY. *n. ſ.* [ἀπεψία.] A loſs of natural concoction. *Quincy.*

(2.) APEPSY may be farther defined a defect in the ſtomach, which prevents the aliment taken in, from affording a proper chyle for ſupplying the blood, and nouriſhing the body. Abſtemiouſneſs and exceſs are alike cauſes of indigeſtion. The method of treatment in the apepſy, is the ſame as in the anorexy. The columbo root is particularly uſeful, when the ſtomach is languid, and digeſtion difficult, &c. It may be given in ſubſtance with any grateful aromatic, or in Madeira wine, now and then interpoſing gentle doſes of rhubarb in tincture. A mixture of muſtard ſeed, with the columbo root, is of great utility in caſes of this nature, where acidity and flatulence prevail much in the *primæ viæ*.

(1.) APER, Marcus, a Roman orator of the firſt century. Some writers have attributed to him the "Dialogue of Orators," which has been frequently printed with the works of Tacitus and Quintilian. He died about 83.

(2.) APER, in ichthyology, the name of a ſea-fiſh, called by ſome *ſtrivale* and *rionda*. It approaches very much in ſhape to the faber or doree, but is much ſmaller.

(2.) APER, in zoology, a ſynonime of the ſus ſcrofa. See SUS.

(3.) * APER. *n. ſ.* [from *ape*.] A ridiculous imitator or mimick.

(4.) APER MOSCHIFERUS, a name by which many authors have called the *tajacu* of America.

(5.) APER PISCIS, a name by which ſome authors have called the ſea-fiſh more uſually called the *capriſcus*.

APEREA,

APEREA, in zoology, a ſmall American animal, of the rabbit kind, and ſeeming to be of a mixt nature between the rabbit and the mouſe, having exactly the ſhort roundith ears of the mouſe, and all the other particulars of the rabbit. It grows, at its full ſize, to 10 or 12 inches long, and its hair is of the colour of our hares on the back and ſides, and whitiſh on the belly.

APERIENS, CROCUS MARTIS, opening ſaffron of iron, a preparation of iron plates or filings, made by expoſing them to the rain or dew, till they contract a ruſt; which is reckoned an aperient medicine.

APERIENS OS, in anatomy, a name given by ſome writers to a muſcle of the mouth, called by Albinus *biventer maxillæ inferioris* and by others *digaſtricus*.

APERIENS PALPEBRAM RECTUS, a name given by ſome anatomiſts to the *levator palpebræ ſuperioris*. See ANATOMY § 193.

(1.) * APERIENT. *adj.* [*aperio*, Lat. to open.] That which has the quality of opening; chiefly uſed of medicines gently purgative.—There be bracelets fit to comfort the ſpirits; and they be of three intentions; refrigerant, corroborant, and *aperient*. *Bacon*.—Of the ſtems of plants, ſome contain a fine *aperient* ſalt, and are diuretick and ſaponaceous. *Arbuthnot*.

(2.) APERIENTS, in the materia medica, are more accurately defined medicines that facilitate the circulation of the humours by removing obſtructions.—The five aperient roots of the ſhops are ſmallage, fennel, aſparagus, parſley, and butcher's broom. The 5 leſſer aperients are, madder, graſs, eryngo, capers, and chammoc.

APERISTATION, [from *a*, without, and περισταω, unfavourable circumſtance,] in the ancient phyſic, denotes an ulcer of a mild, or benign kind, and not attended with any ſevere ſymptom.

* APERITIVE. *adj.* [from *aperio*, Lat. to open.] That which has the quality of opening the excrementitious paſſages of the body.—They may make broth, with the addition of *aperitive* herbs. *Harvey*.

APERLEY, two villages: viz. 1. in Durham, W. of Chopwell; and, 2. in Northumberland.

APERSE, *n. ſ. obſ.* An extraordinary perſon, a perſon of unequalled excellence. *Chaucer*.

APERSIDE, a village in the North Riding of Yorkſhire, near Middleham.

* APERT. *adj.* [*apertus*, Lat.] Open.

(1.) * APERTION. *n. ſ.* [from *apertus*, Lat.] 1. An opening; a paſſage through any thing; a gap.—The next now in order are the *apertions*; under which term I do comprehend doors, windows, ſtaircaſes, chimneys, or other conduits: in ſhort, all inlets or outlets. *Wotton*. 2. The act of opening; or ſtate of being opened.—The plenitude of veſſels, otherwiſe called the plethora, when it happens, cauſeth an extravaſation of blood, either by ruption or *apertion* of them. *Wiſeman*.

(2.) APERTIONS, in architecture, are the openings in a building; as doors, windows, ſtair-caſes, chimneys, outlets and inlets for light, ſmoke, &c. The apertions ſhould be as few as may be; it being a rule, that all openings are weakenings; and they ſhould not approach too near the angles of the walls.

APERTIO PORTARUM, in aſtrology, a great change in the air, upon certain configurations.

* APERTLY. *adv.* [*apertè*, Lat.] Openly; without covert.

* APERTNESS. *n. ſ.* [from *apert*.] Openneſs.—The freedom, or *apertneſs* and vigour of pronouncing, and the cloſeneſs of muffling, and lazineſs of ſpeaking, render the ſound different. *Holder*.

APERTOR OCULI, in anatomy, a name given by Spigelius to the muſcle called *levator palpebræ ſuperioris* by others. See ANATOMY, § 193.

APERTURA FEUDI denotes the loſs of a feudal tenure, by default of iſſue to him to whom the feud or fee was firſt granted.

APERTURA TABULARUM, in ancient law books, ſignifies the breaking open a laſt will and teſtament.

(1.) * APERTURE. *n. ſ.* [from *apertus*, open.] 1. The act of opening.—Hence ariſeth the facility of joining a conſonant to a vowel, becauſe from an appulſe to an *aperture* is eaſier than from one appulſe to another. *Holder*. 2. An open place.—If memory be made by the eaſy motion of the ſpirits through the opened paſſages, images, without doubt, paſs through the ſame *apertures*. *Glanville*. 3. The hole next the object glaſs of a teleſcope or microſcope.—The concave metal bore an *aperture* of an inch; but the *aperture* was limited by an opaque circle, perforated in the middle. *Newton's Opticks*. 4. Enlargement; explanation: a ſenſe ſeldom found.—It is too much untwiſted by the doctors, and like philoſophy, made intricate by explications, and difficult by the *aperture* and diſſolutions of diſtinctions. *Taylor*.

(2.) APERTURE, in geometry, the ſpace between two right lines, which meet in a point and form an angle.

(3.) APERTURE, in opticks, a round hole in a turned bit of wood or plate of tin, placed within the ſide of a teleſcope or microſcope, near to the object glaſs, by means of which more rays are admitted, and a more diſtinct appearance of the object is obtained. According to Huygens, the ſize of the aperture of an object-glaſs of 30 feet is as 30 to 3; *i. e.* as 10 to 1, ſo is the ſquare root of the focal diſtance of any lens, multiplied by 30 to its proper aperture. By experience Mr Azout ſays he found the proper apertures of teleſcopes ought to be nearly in the ſub-duplicate ratio of their length. Object-glaſſes, however, will admit of greater apertures, if the tubes are blackened on the inſide, and their paſſage furniſhed with wooden rings.

(4.) APERTURES, or APERTIONS, in architecture, ſignify doors, windows, chimneys, &c.

APESCROSS, a village in Glouceſterſhire, near Wickſware.

APESLEY, a village in Bedfordſhire, near Wooburn.

APETALOSE. See next article.

* APETALOUS *adj.* [of *a priv.* πεταλον, a leaf.] Without petala or flower leaves.

* APETALOUSNESS. *n. ſ.* [from *apetalous*.] Being without leaves.

APETHORP, a village in Northamptonſhire, 4 miles from Oundel.

APETON, a village in Staffordſhire, near Church-Beaton, on the Penk.

APEUC-

APEUCTIC, [from απευχομαι, I deprecate,] in ancient poetry, a kind of poem or prayer preferred to God for the averting ſome evil, e. gr. *diprohibite minas, dii talem avertite caſum, et placidi ſervate pios.*

APEWOOD, a village in Staffordſhire, NW. of Kinver.

APEWOOD CASTLE. See ABBOTS CASTLE.

(1.) * APEX. *n. ſ. apices*, plur. [Lat.] The tip or point of any thing.—The *apex*, or leſſer end of it, is broken off. *Woodward.*

(2.) APEX, in antiquity, the creſt of a helmet, but more eſpecially a kind of cap worn by the flamens.

(3.) APEX is uſed by grammarians, for a long accent or mark, to denote that a ſyllable is to be pronounced long. Quintilian condemns the practice of putting the apex on all long ſyllables; yet in ſome caſes he allows this apex neceſſary, e. gr. where the different lengths of a ſyllable diſtinguiſh the different ſenſes of a word as in *malus*, which as long, or ſhort, denotes an *ill man*, or an *apple tree*. See ACCENT.

APHACA, in ancient geography, a town in Syria, ſituated between Heliopolis and Byblus, near Lebanon; infamous for a temple of Venus, called *Aphacitis*, near which was a lake, round which fire uſually burſt forth, and its waters were ſo heavy, that bodies floated on them. The temple was deſtroyed by Conſtantine, as being a ſchool of incontinence. The name is of Syriac origin, ſignifying *embraces*.

(1.) * APHÆRESIS. *n. ſ.* [αφαιρεσις.] A figure in grammar that takes away a letter or ſyllable from the beginning of a word.

(2.) APHÆRESIS, in medicine, denotes a neceſſary taking away or removal of ſomething that is noxious. In ſurgery, it ſignifies an operation whereby ſomething ſuperfluous is taken away.

APHANES: A genus of the monogynia order, belonging to the tetandria claſs of plants; and in the natural method ranking under the 35th order, *Senticoſæ*. The eſſential characters are theſe: The calyx is divided into eight parts: there is no corolla; the ſeeds are two, and naked. There is only one ſpecies; viz.

APHANES ARVENSIS, or penſley-piert, a native of Britain. It is extremely common in corn-fields. The ſtalks riſe 5 or 6 together; they are 3 inches long, round, hairy, and procumbent: the leaves ſtand very thick upon them, and are roundiſh, but divided, as it were, into 3 parts, and thoſe deeply ſerrated at their edges. The flowers come out in a double ſeries, arranged all along the branches, and are of a greeniſh white, and the whole plant is of a greyiſh or whitiſh green colour.

APHARSACHITES, or APHARSATHCHITES, } See SAMARITANS.

APHASIA, [from α, and φημι, I ſpeak,] in the ſceptic philoſophy, denotes a ſtate of doubt, wherein a perſon not knowing what to determine on, it is beſt for him to be ſilent. In this ſenſe, *aphaſia* ſtands oppoſed to *phaſis*, under which are included both aſſertion and negation.

APHEK, the name of ſeveral cities mentioned in ſcripture; viz. 1. Aphek in the tribe of Judah, where the Philiſtines encamped, when the ark was brought from Shiloh, which was taken by them in battle, 1 Sam. iv. 1, 2, &c. It is thought to be the ſame with Aphekah mentioned in Joſh. xv. 53. 2. Aphek in the valley of Jezreel, where the Philiſtines encamped while Saul and his army were near Jezreel, upon the mountains of Gilboa; 1 Sam. xxix. 1, &c. 3. A city belonging to the tribe of Aſher, near the country of the Sidonians; (Joſh. xiii. 4, and xix. 30.): 4. A city of Syria, one of the principal in Benhadad's kingdom, near which the battle was fought between Ahab and Benhadad, wherein the Syrians were worſted; and whereof, as they retreated with precipitation into the city, the walls fell upon them, and cruſhed 27,000; 1 Kings xx. 26, *et ſeq.* This city lay between Heliopolis and Biblos: See APHACA.

APHEKAH. See laſt article.

APHELIA, [from αφελης, ſimple,] in rhetoric, is uſed to denote ſimplicity of diction.

* APHELION. *n. ſ. aphelia*, plur. [from απο, and ηλιος, the ſun.] That part of the orbit or planet, in which it is at the point remoteſt from the ſun.—The reaſon why the comets move not in the zodiac, is, that, in their *aphelia*, they may be at the greateſt diſtances from one another; and conſequently diſturb one another's motions the leaſt that may be. *Cheyne.*

APHELIUM. See laſt article.

APHERNOUSLI. a ſpecies of pine growing wild on the Alps. The timber is large, and the planks made of it are of a finer grain, and more beautifully variegated than deal; and may therefore be applied to many uſes. It grows in bleak and barren ground, and moſt reſembles that which is called in England the Weymouth pine.

APHESIS, [from αφιημι, I remit,] in the Athenian laws, was applied to the caſe of a perſon deeply indebted, who deſired the people to remit part of the debt, on account of his diſability to make payment. Voetius has a diſſertation on the words *apheſis* and *pareſis*, and their difference.

* APHETA. *n. ſ.* [with aſtrologers.] The name of the planet, which is imagined to be the giver or diſpoſer of life in a nativity. *Diſt.*

APHETERIA, in the ancient military art, a kind of engines uſed in the beſieging of towns.—Suidas does not mention their particular form or ſtructure. Aquinas takes them to have been of the projectile kind.

* APHETICAL. *adj.* [from *apheta.*] Relating to the apheta.

APHGASI, a tribe of Tartars, who reſide near the Caſpian ſea, W. of the Wolga.

(1.) * APHILANTHROPY. *n. ſ.* [α without, and φιλανθρωπια, love of mankind.] Want of love to mankind.

(2.) APHILANTHROPY, [from α, φιλος, friend, and ανθρωπος, man,] among phyſicians, denotes the ſtate or diſorder, wherein a perſon has an unnatural diſreliſh for mirth and ſociety, and indulges ſolitude and melancholy.

APHIOCEM, a compoſition made principally of the buds of hemp before they flower. It is much in uſe among the Arabs, and has the intoxicating quality of opium.

APHIOM, APHIOU, or APHIUM, } KARAHISSART, a town of Natolia, in Aſiatic Turkey; ſo named, becauſe it produces a great

great deal of opium, called *aphiom* by the Turks. It was formerly the patrimony of Othman, the founder of the Turkiſh monarchy. Lon. 32. 18. E. Lat. 38. 55. N.

(1.) APHIS, in zoology, the PUCERON, VINE-FRETTER, or PLANT-LOUSE; a genus of inſects belonging to the order of inſecta hemiptera.—The roſtrum or beak of the aphis is inflected; the antennæ or feelers are longer than the thorax; the wings are 4, and erect, or they are wanting; the feet are of the ambulatory kind; and the belly often ends in two horns, from which is ejected that moſt delicate juice called HONEYDEW; which ſee. Linnæus enumerates 33 ſpecies of the aphis, all of them inhabitants of particular plants, from which their trivial names are taken; as, APHIS RIBIS, ROSÆ, ULMI, &c.: And he adds, that there ſeem to be a greater variety of plants producing aphides than there are different ſorts of this inſect. But ſome late obſervers have been able to diſtinguiſh more than double the above number of ſpecies; and it is probable that many more remain ſtill to be added, as many of the ſame kind of plants are found to ſupport two or three quite different ſorts of aphides. Thus the plum-tree has two ſorts very diſtinct from each other: one of a yelloviſh green, with a round ſhort body; the other of a bluiſh green, as it were enamelled with white, and the ſhape more oblong. On the gooſeberry-buſh and currant the ſame aphides may be found; but each of theſe is inhabited by two very different ſpecies: one being of a duſky green with a ſhort plump body; the other of a paler green, the body more taper, and tranſverſely wrinkled. The roſe tree, again, ſupports not leſs than three diſtinct ſpecies: the largeſt is of a deep green, having long legs of a browniſh caſt, with the joints of a very dark brown, as are alſo the horns and antennæ; a and ſort is of a paler green, has much ſhorter legs, and a more flat body; the third ſort is of a pale red, its body tranſverſely wrinkled, and is moſt frequently on the ſweet-briar.

(2.) APHIS, EXTRAORDINARY GENERATION OF THE. The extraordinary nature of theſe inſects has for ſome time paſt juſtly excited the wonder and attention of naturaliſts. They were long ranked among the animals which had been claſſed with the true androgynes ſpoken of by Mr Breynius; for having never been catched copulating, it was haſtily concluded that they multiplied without copulation. This, however, was but a doubt, or at beſt a mere ſurmiſe: but this ſurmiſe was believed and adopted by Mr Reaumur; and though he ſupported it by ſome obſervations peculiar to himſelf, the queſtion remained ſtill undecided, till Mr Bonnet ſeemed to have cleared it up in the affirmative, by taking and ſhutting up a young aphis at the inſtant of its birth, in the moſt perfect ſolitude, which yet brought forth in his ſight 95 young ones. The ſame experiment being made on one of the individuals of this family, that had been tried with its chief, the new hermit ſoon multiplied like its parent; and one of this third generation, in like manner brought up in ſolitude, proved no leſs fruitful than the former. Repeated experiments, in this reſpect, as far as the fifth or ſixth generation, all uniformly preſenting the obſerver with *fecund virgins*, were communicated to the Royal Academy of Sciences; when an unforeſeen and very ſtrange ſuſpicion, imparted by Mr Trembley to Mr Bonnet, engaged him anew in a ſeries of ſtill more painful experiments than the foregoing. In a letter which that celebrated obſerver wrote to him from the Hague, the 27th January 1741, he thus expreſſes himſelf: "I formed, ſince the month of November, the deſign of rearing ſeveral generations of ſolitary pucerons, in order to ſee if they would all equally bring forth young. In caſes ſo remote from uſual circumſtances, it is allowed to try all ſorts of means; and I argued with myſelf, Who knows, but that one copulation might ſerve for ſeveral generations? This "*who knows*," to be ſure, was next to avouching nothing; but as it came from Mr Trembley, it was ſufficient to perſuade Mr Bonnet that he had not gone far enough in his inveſtigation. If the fecundity of aphides was owing to the ſecret copulation ſuggeſted by Mr Trembley; this copulation ſerved at leaſt five or more ſucceſſive generations. Mr Bonnet therefore reared to the amount of the tenth generation of ſolitary aphides, and had the patience to keep an account of the days and hours of the births of each generation. In ſhort, it was diſcovered, That they are really diſtinguiſhed by ſexes: That there are males and females amongſt them, whoſe amours are the leaſt equivocal of any in the world: that the males are produced only in the tenth generation, and are but few in number: that theſe ſoon arriving at their full growth, copulate with the females: that the virtue of this copulation ſerves for ten generations: that all theſe generations, except the firſt, (from the fecundated eggs) are produced viviparous; and all the individuals are females, except thoſe of the laſt generations, among whom, as we have already obſerved, ſome males make their appearance, to lay the foundations of a freſh ſeries.—Theſe circumſtances have been confirmed by other naturaliſts. In particular, we have a curious and accurate detail of them by Dr Richardſon of Rippon, in the Philoſophical Tranſactions, Vol. xi. art. 22. an extract of which we ſhall here inſert, in order to give the reader as full an inſight into the nature of theſe ſingular inſects, as can be done by a mere detail of facts in themſelves utterly unaccountable.

(3.) APHIS, FARTHER ACCOUNT OF THE. "The great variety of ſpecies which occur in the inſects now under conſideration, may make an inquiry into their particular nature ſeem not a little perplexed; having them, however, ſkilfully reduced under their proper genus, the difficulty is by this means conſiderably diminiſhed. All the inſects comprehended under any diſtinct genus, we may reaſonably ſuppoſe to partake of one general nature; and, by diligently examining any of the particular ſpecies, may thence gain ſome inſight into the nature of all the reſt. With this view I have choſen, out of the various ſorts of aphides, the largeſt of thoſe found on the roſe tree; not only as its ſize makes it the more conſpicuous, but as there are few others of ſo long duration. This ſort, appearing early in the ſpring, continues late in the autumn; while ſeveral are limited to a much ſhorter term, in conformity to the different trees

and plants from whence they draw their nouriſhment. I. If at the beginning of February the weather happens to be ſo warm as to make the buds of the roſe tree ſwell and appear green; ſmall aphides are frequently to be found upon them, not larger than the young ones in ſummer when firſt produced. But there being no old ones to be found at this time of the year, which in ſummer I had obſerved to be viviparous, I was formerly not a little perplexed by ſuch appearances, and almoſt induced to give credit to the old doctrine of equivocal generation. That the ſame kind of animal ſhould at one time of the year be viviparous, and at another time oviparous, was an opinion I could then by no means entertain. This, however, frequent obſervation has at laſt convinced me to be fact; having found thoſe aphides which appear early in the ſpring, to proceed from ſmall black oval eggs which were depoſited on the laſt year's ſhoots in autumn: though, when it happens that the inſects make too early an appearance, I have obſerved the greateſt part to ſuffer from the ſharp weather that uſually ſucceeds, by which means the roſe trees are ſome years in a manner freed from them. Thoſe which withſtand the ſeverity of the weather ſeldom come to their full growth before the month of April; at which time they uſually begin to breed, after twice caſting off their exuviæ or outward covering. It appears then that they are all females, which produce each of them a very numerous progeny, and that without having intercourſe with any male inſect. As I obſerved before, they are viviparous; and what is equally uncommon, the young ones all come into the world backwards. When they firſt come from the parent, they are enveloped by a thin membrane, having in this ſituation the appearance of an oval egg; which, I apprehend, muſt have induced Reaumur to ſuſpect that the eggs diſcovered by Bonnet were nothing more than mere abortions. Theſe egg-like appearances adhere by one extremity to the mother; while the young ones contained in them extend the other; by that means gradually drawing the ruptured membrane over the head and body to the hind feet. During this operation, and for ſome time after, by means of ſomething glutinous, the fore part of the head adheres to the vent of the parent. Being thus ſuſpended in the air, it ſoon frees itſelf from the membrane in which it was confined, and, after its limbs are a little ſtrengthened, is ſet down on ſome tender ſhoot, and then left to provide for itſelf."

(4.) APHIS, OTHER PHÆNOMENA RESPECTING THE. "II. In the ſpring months, there appear on the roſe trees but two generations of aphides, including thoſe which immediately proceed from the laſt year's eggs; the warmth of the ſummer adds ſo much to their fertility, that no leſs than five generations ſucceed one another in the interval. One is produced in May, which caſts off its covering; while the months of June and July each ſupply two more, which caſt off their coverings three or four times, according to the different warmth of the ſeaſon. This frequent change of the outward covering is the more extraordinary, as it is the oftener repeated when the inſects come the ſooneſt to their growth; which I have ſometimes obſerved to happen in ten days, where warmth and plenty of nouriſhment have mutually conſpired. From which conſiderations I am thoroughly convinced that theſe various coverings are not connate with the inſect; but that they are, like the ſcarf-ſkin, ſucceſſively produced. Early in the month of June, ſome of the third generation which were produced about the middle of May, after caſting off their laſt covering, diſcover four erect wings, much longer than their bodies: and the ſame is obſervable in all the ſucceeding generations, which are produced during the ſummer months; without, however, diſtinguiſhing any diverſity of ſex, as is uſual in ſeveral other kinds of inſects. For ſome time before the aphides come to their full growth, it is eaſy to diſcover which of them will have wings, by a remarkable fulneſs of the breaſt, which, in the others, is hardly to be diſtinguiſhed from the body. When the laſt covering is ejected, the wings, which were before folded up in a very narrow compaſs, gradually extend themſelves in a moſt ſurpriſing manner, till their dimenſions are at laſt very conſiderable. But theſe winged ones have the peculiarity, that the number of them does not ſeem ſo much to depend on their original ſtructure, as on the quantity or quality of the nouriſhment with which they are ſupplied: it being frequently obſerved, that thoſe on a ſucculent ſhoot have few or none with wings among them, while others of the ſame generation, on a leſs tender branch, are moſt of them winged; as if only the firſt rudiments of wings were compoſed in the former, while nature thought proper to expand them in the latter, that they might be more at liberty to ſupply their wants. The increaſe of theſe inſects in the ſummer time is ſo very great, that, by wounding and exhauſting the tender ſhoots, they would frequently ſuppreſs all vegetation, had they not many enemies which reſtrain them. To enumerate the variety of other inſects that in their worm and fly ſtate are conſtantly deſtroying them, would exceed the bounds of the preſent deſign: there is one, however, ſo ſingular in the manner of executing its purpoſe, that I cannot paſs by it without ſome further notice. This is a very ſmall black ichneumon fly, with a ſlender body and very long antennæ, which darts its pointed tail into the bodies of the aphides, at the ſame time depoſiting an egg in each. This egg produces a worm, which feeds upon the containing inſect till it attains its full growth; when it is uſually changed to that kind of fly from whence it came. In this, however, it is ſometimes prevented by another ſort of ſmall black fly, which wounds this worm through its pearl-like habitation; and by laying one of its eggs therein, inſtead of the former fly, produces its own likeneſs. I muſt, however, further obſerve, notwithſtanding theſe inſects have many enemies, they are not without friends; if we may conſider thoſe as ſuch who were very officious in their attendance, for the good things they expect to reap thereby. The ant and the bee are both of this kind, collecting the honey in which the aphides abound; but with this difference, that the ants are conſtant viſitors, the bee only when flowers are ſcarce. To which let me alſo add, that the ants will ſuck in the delicious

nectar

nectar while the aphides are in the act of discharging it from the anus; but the bees only collect it from the leaves on which this honey dew has fallen."

(5.) APHIS, SEXES, &c. OF THE, DESCRIBED. "III. In the autumn I find three more generations of aphides to be produced; two of which make their appearance in the month of August, and the third usually appear before the middle of September. As the two first differ in no respect from those which we meet with in summer, it would be wasting time to dwell any longer upon them; but the third, differing greatly from all the rest, demands our giving it a more serious attention. Though all the aphides which have hitherto appeared were females, in this tenth generation are found several male insects; not that they are by any means so numerous as the females, being only produced by a small number of the former generation. To which I must further add, that I have observed those which produce males, previously to have produced a number of females; which in all respects resembling those already described, I shall decline taking into any further consideration. The females have at first altogether the same appearance with those of the former generation; but in a few days their colour changes from a green to a yellow, which is gradually converted into an orange colour before they come to their full growth. They differ likewise in another respect, at least from those which occur in summer, that all those yellow females are without wings. The male insects are, however, still more remarkable, their outward appearance readily distinguishing them from the females of this and of all other generations. When first produced, they are not of a green colour like the rest, but of a reddish brown; and have afterwards, when they begin to thicken about the breast, a dark line along the middle of the back. These male insects come to their full growth in about three weeks time, and then cast off their last covering; the whole insect being after this operation, of a bright yellow colour, the wings only excepted. But after this they soon change to a darker yellow, and in a few hours to a very dark brown; if we except the body, which is something lighter coloured, and has a reddish cast. They are all of the winged sort; and the wings, which are white at first, soon become transparent, and at length appear like very fine black gauze. The males no sooner come to maturity than they copulate with the females; in which act they are readily discovered, as they remain in conjunction for a considerable time, and are not easily disturbed. The commerce between them continues the whole month of October, and may be observed at all times of the day, though I have found it most frequent about noon; especially when the weather is moderately warm, and the sun overcast. The females, in a day or two after their intercourse with the males, I have observed to lay their eggs; which they usually do near the buds; when they are left to their own choice. Where there are a number crowded together, they of course interfere with each other; in which case they will frequently deposite their eggs on other parts of the branches, or even on the spines with which they are beset." These insects are found in great numbers not only on the stems and leaves, but even upon roots of many trees and plants. See *Plate* XIII. *Fig.* 7. Those trees that are most loaded with the insects, as already observed, differ greatly from them. The plant lice thrust their sharp pointed rostrum into the substance of the leaf to draw out their sustenance, which wraps the stems and leaves, and occasions in the latter cavities underneath, and swellings above; nay, even in some, a kind of hollow gall filled with insects, as is often seen on elm leaves. It appears astonishing that the slight puncture of so small an animal should so greatly disfigure a plant: but it must be remembered, that plant lice always live in numerous associations, which increase visibly by the prodigious fruitfulness of those insects: so that although each puncture be slight, yet the number of them is so great, so reiterated, that it is no longer a wonder the leaves should be disfigured. Lovers of gardening and plants are extremely anxious to free and cleanse their trees from these vermin; but their care often proves unavailing, the insects are so fruitful that they soon produce a fresh colony. The best and surest method of extirpating them, is to put on the trees infested with them some larvæ of the plant louse lion, or aphidivorous flies. (See COCCINELLA, ICHNEUMON, HEMEROBIUS, &c.) For those voracious larvæ destroy every day a great number of these insects, and that with so much the more facility, as the latter remain quiet and motionless in the neighbourhood of these dangerous enemies, who range over heaps of plant lice which they gradually diminish and extirpate.

APHONIA, among physicians, signifies a suppression or total loss of voice. It is never a primary disease. But a consequence of many different disorders. The cure is to be effected by removing the disorder from whence the aphonia proceeds.

* APHONY. *n. f.* [ἀ, without, and φωνη, speech.] A loss of speech. *Quincy.*

(1.) * APHORISM. *n. f.* [ἀφορισμος.] A maxim; a precept contracted in a short sentence; an unconnected position.—He will easily discern how little of truth there is in the multitude; and though sometimes they are flattered with that *aphorism*, will hardly believe the voice of the people to be the voice of God. *Brown's Vulgar Errours.*—I shall at present consider the *aphorism*, that a man of religion and virtue is a more useful, and consequently a more valuable member of a community. *Rogers.*

(2.) APHORISM is chiefly used in medicine and law. We say, the aphorisms of Hippocrates, of Sanctorius, of Boerhaave, aphorisms of the civil law, &c. It is sometimes used in divinity too.—We have seen a work entitled *Aphorisms of Faith.*

* APHORISTICAL. *adj.* [from *aphorism.*] In the form of an aphorism; in separate and unconnected sentences.

* APHORISTICALLY. *adv.* [from *aphoristical.*] In the form of an aphorism.—These being carried down, seldom miss a cure, as Hippocrates doth always *aphoristically* tell us. *Harvey.*

APHLASTUM, [from ἀ and φλαω, frangible,] in the ancient navigation, a wooden instrument, shaped like a plume of feathers, fastened on the goose's or swan's neck used by the ancient Greeks

in the heads of their ſhips. The apluſtum had much the ſame office and effect in a ſhip that the creſt had on a helmet. It ſeems alſo to have had this farther uſe, viz. by the waving of a party coloured ribband faſtened to it, to indicate from what quarter the wind blew. The *apbluſtum* was the proper ornament of the head, as the *acroſtolium* was of the ſtern. The Greek *aphluſtum* anſwered to, and was probably the origin of the Latin *apluſter*.

APHRACTI, [from α and φρασσω, incloſed,] in the ancient military art, denotes open veſſels, without decks or hatches, furniſhed only at head and ſtern with croſs planks, whereon the men ſtood to fight.

(1.) APHRODISIA, a ſea-port of Caramania.

(2.) APHRODISIA, in antiquity, feſtivals in honour of the goddeſs Αφροδιτη, or Venus. There are ſeveral of theſe aphrodiſia obſerved in divers parts of Greece; the moſt remarkable was that at Cyprus, firſt inſtituted by Cinyras, out of whoſe family certain prieſts of Venus were elected, and for that reaſon named Κινυραδαι. At this ſolemnity ſeveral myſterious rites were practiſed: all who were initiated to them offered a piece of money to Venus as a harlot, and received as a token of the goodeſs's favour a meaſure of ſalt, and a φαλλος; the former, becauſe ſalt is a concretion of ſea-water, to which Venus was thought to owe her birth; the latter, becauſe ſhe was the goddeſs of wantonneſs.

(3.) APHRODISIA is alſo uſed for the age of venery, more frequently denominated *puberty*.

(4.) APHRODISIA, venereal intercourſe.

(5.) APHRODISIA PHRENITIS, violent love, to a degree of madneſs.

APHRODISIACA. See APHRODISIAC, N° 2.

* APHRODISIACAL. } *adj.* [from αφροδισια,
(1.) * APHRODISIACK. } Venus] Relating to the venereal diſeaſe.

(2.) APHRODISIAC. We have often had occaſion to remark Dr Johnſon's deficiences, but the above definition, (§ 1.) is poſitively erroneous, Aphrodiſiacs, in pharmacy, comprehend only that claſs of medicines, which tend to increaſe the ſeed, and conſequently to give vigour, and an inclination to venery, to perſons of cold, or exhauſted conſtitutions; whether owing to age, exceſſive indulgence, or natural impotence. We do not recollect any medical author who uſes the word in the ſenſe above ſtated by the doctor. Some indeed have applied the word APHRODISIA, we know not for what reaſon, to the epilepſy.

APHRODISIACE, in the writings of the ancients, a name given to a gem, ſuppoſed, according to the idle traditions of thoſe times, to have a power of procuring love to the perſon who wore it about him; all the deſcription we have of it is, that it was of a pale fleſh colour; but the ſtone, as well as its virtues, are now wholly unknown.

APHRODISIUM, a town of Tunis.

APHRODISIUS, in chronology, denotes the eleventh month in the Bithynian year, commencing on the 25th of July in ours.

APHRODITA, in zoology, an inſect of the order of vermes molluſca. The body of the aphrodita is oval, with many ſmall tentacula or protuberances on each ſide, which ſerve as ſo many feet: The mouth is cylindrical, at one end of the body, and capable of being retracted, with two briſtly tentacula. There are four ſpecies of this inſect; viz.

(1.) APHRODITA ACULEATA, by ſome called the ſea moule, with 32 tentacula or feet, an inhabitant of the European ſeas, and often found in the belly of the cod fiſh. It feeds upon ſheil fiſh. See *Plate* XIII. *fig.* 8.

(2.) APHRODITA IMBRICATA is very like the ſquamata, (N° 4.) only its ſcales are more glabrous. It inhabits the northern ocean.

(3.) APHRODITA SCABBA, of an oblong ſhape, ſcabrous on the back, with 20 tentacula. It inhabits the Belgic ſea. It is ſometimes taken off Brighthelmſtone, an inch long.

(4.) APHRODITA SQUAMATA, with 24 feet, and ſcaly on the back. The mouth is wrapt up in an aperture, and the tail is terminated by a very few ſhort briſtles. It inhabits the European ocean.

APHRODITARIUM, in the ancient pharmacy, denotes a kind of dry medicine, compounded of frankincenſe, the ſcales of copper, ceruſs, ſtarch, and pomegranates, mixed in equal quantities. The name is alſo given to a kind of *collyrium*, mentioned by Galen.

APHRODITE, in mythology, a name of Venus, derived from αφρος, froth; becauſe, according to the poets, Venus is ſuppoſed to have been produced from the froth or foam of the ſea.

APHRODITES, in natural hiſtory, a name given by ſome author to the fineſt ſpecies of amethyſt. See GEMMA VENERIS.

APHROGALA, [from αφρος, froth, and γαλα, milk,] in the ancient phyſic, denotes a kind of whipt cream, or milk agitated till it be converted wholly into froth. The aphrogala is directed by Galen as proper againſt hot diſorders of the ſtomach.

APHROLITRUM, in the ancient phyſic, denotes the froth of litrum. In which ſenſe, *aphrolitrum* ſeems to amount to the ſame with *aphronitrum*. Hoffman affirms, that the nitron and litron only differ in name. It appears, however, there was a great difference between the two medicines, aphrolitrum reſembling meal, or farina, and being of a kind of intermediate virtue between aphronitrum and ſalt.

APHRONITRE, [from αφρος, and νιτρον, nitre,] a kind of nitre, mentioned by the ancients; ſuppoſed to be the lighteſt part thereof, emerging to the top. Some modern naturaliſts rather take the ancient *aphronitre* to have been a native ſalt-petre, now called ſalt-petre of the rock. Greek authors expreſſed two different ſubſtances by the word *aphronitrum*; the one, the native nitre of thoſe ages; and the other the ſpume of the veſſels in which they purified their nitre: Galen plainly tells us, that theſe were two different ſubſtances.

APHROSELENOS, among ancient naturaliſts, a denomination given to the *ſelenites*, or *lapis ſpecularis*.

APHTHÆ, in medicine, ſmall, round, and ſuperficial ulcers ariſing in the mouth. See MEDICINE, *Index*.

APHTHARTODOCETÆ, [from αφθαρτος, incorruptible, and δοκεω, to imagine,] a ſect of ſworn enemies to the council of Chalcedon. The name

was given them, becauſe they imagined the body of Jeſus Chriſt was incorruptible and impaſſible, and not capable of death. They aroſe among the Eutychians, and made their firſt appearance in the year 535.

APHUA COBITES, in ichthyology, the name of a ſmall fiſh common in the Mediterranean and ſome other ſeas, and called by us the ſea-loach. It never exceeds three or four inches in length, its body is round, and flatted a little on the back: its colour is white variegated with black ſpots.

APHYLLANTHES, LEAFLESS FLOWER, or BLUE MONTPELLIER PINK: A genus of the monogynia order, belonging to the hexandria claſs of plants; and in the natural method ranking under the 5th order, *Tetrapetaloidæ*. In character it differs not from the JUNCUS or ruſh but in having a calyx of ſix petals, whereas the juncus has no calyx. There is only one ſpecies; viz.

APHYLLANTHES MONTPELIENSIS, a native of France. The root conſiſts of a number of ſlender, hard, woody, long, and contorted fibres: the radical leaves are very numerous, two inches long, extremely narrow, and wither very quickly. The ſtalk is round, ſmooth, without a joint or knot, naked, and tolerably firm; at its top ſtands a ſingle and very beautiful blue flower, ariſing from a kind of compound imbricated cup.

APHYLLION, in botany, the broom rape.

APIARIA, in natural hiſtory, a ſpecies of fly found only in autumn, and frequently met with on parſley; it is two-winged, of a deep and ſhining black, and gathers wax on its legs in the manner of the bee. It is a ſpecies of the *attelabus*.

(1.) * APIARY. *n. ſ.* [from *apis*, Lat. a bee.] The place where bees are kept.—Thoſe who are ſkilled in bees, when they ſee a foreign ſwarm approaching to plunder their hives, have a trick to divert them into ſome neighbouring *apiary*, there to make what havock they pleaſe. *Swift*.

(2.) APIARY, SITUATION PROPER FOR AN. Mr James Bonner in his "New Plan for ſpeedily increaſing the number of Bee hives in Scotland," adviſes, "as a general rule, to place the hives where they will be leaſt expoſed to the wind, and enjoy as much of the influence of the ſun as poſſible; for wind always retards the bees in their work, while the ſun-beams invite them to it. In the neighbourhood of the apiary there ſhould be abundance of flowers, from which the bees may collect their wax and honey."—He recommends, as the beſt place for an apiary, "an early ſituation,—a hollow glen by the ſide of a rivulet, ſurrounded with abundance of turnips in bloſſom in the ſpring; muſtard and clover in ſummer, and heath in the end of ſummer and harveſt: with a variety of other garden and wild flowers in their ſeaſons:"—but he adds, that bees have thriven amazingly well, where they were not within reach of many of the above-mentioned flowers." See BEE.

APIASTELLUM, in botany, the name of two different ſpecies of plants with different authors; Dodonæus expreſſing by it the common baum, and Apuleius the black bryony.

APIASTER, in ornithology, the bee-eater, a ſpecies of the merops. See MEROPS.

APIASTRUM, in botany, a name given by the ancients to two different plants, of ſuch contrary form and qualities, that it is unlucky they ſhould have given occaſion of confounding them together, as miſtakes about them might be of fatal conſequence. The one of theſe plants was the poiſonous water crowfoot; which they called apiaſtrum, becauſe of its having leaves that ſomewhat reſembled ſinallage. The other apiaſtrum is the common garden baum, ſo called by theſe writers, from their having obſerved that the bees were very fond of it. Beſides this they have in ſome places called *ſelinum* by this name, from its reſembling parſley, which they called apium.

(1.) * APICES *of a flower*. [Lat. from *apex*, the top.] Little knobs that grow on the tops of the ſtamina, in the middle of a flower. They are commonly of a dark purpliſh colour. By the microſcope they have been diſcovered to be a ſort of *capſule ſeminales*, or ſeed veſſels, containing in them ſmall globular, and often oval particles, of various colours, and exquiſitely formed. *Quincy*.

(2.) APICES are the ſame with *antheræ*. See ANTHERA. The particles above mentioned, (§ 1.) are called *farina fœcundans*, and are a kind of male ſperm in vegetables, which falling down into the flower, ripens the ſeed and renders it fit for propagation. The neceſſity of theſe, for the propagation of plants, is remarkable in thoſe vegetables, which produce male and female flowers on different plants: as, though both will grow, yet neither will produce ſeed capable of propagation, when planted ſeparate.

APICUS, a Roman ſirname, famous, or rather *infamous*, for producing three remarkable gluttons. The ſecond is the moſt celebrated of the three. He lived under Tiberius, ſpent immenſe ſums on his belly, and invented divers ſorts of cakes which bore his name. He kept as it were a ſchool of gluttony at Rome. After having ſpent two millions and a half in entertainments, finding himſelf very much in debt, he examined into the ſtate of his affairs; and ſeeing that he had but 250,000 livres remaining, he poiſoned himſelf, out of apprehenſion of ſtarving with ſuch a ſum! He had proſtituted himſelf when very young to Sejanus.

APICULUM, in antiquity, a kind of thread or fillet which the flamins wore, in the heat of ſummer, in lieu of the apex. Feſtus ſpeaks of the apiculum, as a cover for the apex; but the paſſage ſeems to be corrupted.

* APIECE. *adv.* [from *a* for *each*, and *piece*, or ſhare.] To the part or ſhare of each.—Men, in whoſe mouths at firſt ſounded nothing but mortification, were come to think that they might lawfully have ſix or ſeven wives *apiece*. *Hooker*.—I have to night diſpatched ſixteen buſineſſes, a month's length *apiece*, by an abſtract of ſucceſs. *Shakeſpeare*.—One copy of this paper may ſerve a dozen of you, which will be leſs than a farthing *apiece*. *Swift*.

APINA, or APINÆ, } a town of Apulia, built by Diomedes, as was alſo Tricæ.

APINÆ AND TRICÆ, a proverbial ſaying for things trifling and of no value.

APINARIUS, a trifler or buffoon.

APINEL, the name of an American root, called by the natives YABACANY.

APIOLÆ, in ancient geography, a city of Italy which was taken by Tarquin I. and with the plunder

plunder thereof, according to Pliny, he founded the Capitol of Rome.

APION, a famous grammarian, born in Egypt, was a profeſſor at Rome in the reign of Tiberius. He had all the arrogance of a mere pedant, and amuſed himſelf with inquiries, difficult in their inveſtigation, and inſignificant in their conſequences. One of his principal works was his Antiquities of Egypt.

APIOS, in botany, a name given by many authors to thoſe ſpecies of the *tithymal*, or ſpurge, which have tuberoſe or knobby roots. Apios is alſo the name given by Boerhaave to ſome of the leguminous plants, compriſed by Linnæus under the name GLYCINE.

(I.) APIS, in aſtronomy, the BEE, a ſouthern conſtellation, called alſo MUSCA.

(II.) APIS, in fabulous hiſtory, the ſon of Jupiter and Niobe, and king of the Argives. Leaving that kingdom to his brother, he travelled into Egypt, where he taught the inhabitants agriculture, the planting of vineyards and other uſeful arts, whereupon they made him their king while he lived, and their god when he died. See N° III. § 1—5.

(III. 1.) APIS, in mythology, a divinity worſhipped by the ancient Egyptians at Memphis. It was a living ox, having certain exterior marks: in which animal the ſoul of the great Oſiris was ſuppoſed to ſubſiſt! This animal had the preference to all others, as being the ſymbol of agriculture, the improvement of which that prince had ſo much at heart.

(2.) APIS, BIRTH AND MARKS OF. According to ſeveral learned writers on the Egyptian religion Apis was only a ſymbolical deity. "Amongſt the animals conſecrated to ancient rites, ſays Ammianus Marcellinus, Menvis and Apis are the moſt celebrated: the firſt is an emblem of the ſun, the ſecond of the moon." Prophyry tells us, that Apis bore the characteriſtic ſigns of the two ſtars; and Macrobius, who confirms this opinion, adds, that he was equally conſecrated to them both. This bull, the object of public adoration, it may be ſuppoſed, could not be born like other animals. Accordingly, the prieſts publiſhed, that his origin was celeſtial. "An Apis is ſeldom born," ſays Pomponius Mela. "He is not produced by the ordinary laws of generation. The Egyptians ſay he owes his birth to celeſtial fire." Plutarch explains this paſſage; "The prieſts pretend, that the moon diffuſes a generative influence, and as ſoon as a cow who takes the bull, is ſtruck by it, ſhe conceives an Apis. Accordingly, we diſcover in him the ſigns of that ſtar."—Such were the fables induſtriouſly ſpread by thoſe who preſided over theſe pretended *divine* inſtitutions. The ignorant people, to whom this emblematical deity preſaged abundance, received them eagerly, and implicitly believed them. Pliny has deſcribed the characters which diſtinguiſhed this ſacred bull: "A white ſpot, reſembling a creſcent, on the right ſide, and a lump under the tongue, were the diſtinguiſhing marks of Apis." When a cow, therefore, which was thought to be ſtruck with the rays of the moon, produced a calf, the ſacred guides went to examine it and if they found it conformable to this deſcription, they announced to the people the birth of Apis, and fecundity.

(3.) APIS, INAUGURATION, PALACE, &c. OF. Ælian informs us, that as ſoon as a calf of the above deſcription was produced, "the Egyptians immediately built a temple to the new god, facing the riſing ſun, according to the precepts of Mercury, where they nouriſhed him with milk for four months. This term expired, the prieſts repaired in pomp to his habitation, and ſaluted him by the name of Apis. They then placed him in a veſſel magnificently decorated, covered with rich tapeſtry, and reſplendent with gold, and conducted him to Nilopolis, ſinging hymns, and burning perfumes. There they kept him for 40 days. During this ſpace of time, women alone had permiſſion to ſee him, and ſaluted him in a particular manner. After the inauguration of the god in this city, he was conveyed to Memphis with the ſame retinue, followed by an innumerable quantity of boats, ſumptuouſly decked out. There they completed the ceremonies of his inauguration, and he became ſacred to all the world. Apis was ſuperbly lodged, and the place where he lay was myſtically called *the bed*. Strabo having viſited his palace, thus deſcribes it: "The edifice where Apis is kept, is ſituated near the temple of Vulcan. He is fed in a ſacred apartment, before which is a large court. The houſe in which they keep the cow that produced him, occupies one of its ſides. Sometimes, to ſatisfy the curioſity of ſtrangers, they make him go out into this court. One may ſee him at all times through a window; but the prieſts produce him to public view."—"Once a year," ſays Solinus, "they preſent a heifer to him, and the ſame day they kill her."—A bull born in ſo marvellous a manner, *muſt* be poſſeſſed of ſupernatural knowledge. Accordingly, the prieſts publiſhed, that he predicted future events, by geſtures, by motions, and other ways, which they conſtrued according to their fancy. "Apis," ſays Pliny, "has two temples, called *Beds*, which ſerve as an augury for the people. When they come to conſult him, if he enters into a particular one, it is a favourable preſage, and fatal if he paſſes into the other. He gives anſwers to individuals, by taking food from their hands. He refuſed that offered him by Germanicus, who died ſoon after." It would be unjuſt to conclude that this reſpectable writer gave credit to ſuch auguries. He relates the opinion of the Egyptians, and contents himſelf with citing facts without offering his judgment. Such was the inſtallation of Apis. His aniverſary was always celebrated for ſeven days. The people aſſembled to offer ſacrifices to him, and what is extraordinary, oxen were immolated on the occaſion. This ſolemnity did not paſs without prodigies. Ammianus Marcellinus, who has collected the teſtimonies of the ancients, relates them in theſe words: "During the ſeven days, in which the prieſts of Memphis celebrate the birth of Apis, the crocodiles forget their natural ferocity, become gentle, and do no harm to any body!"

(4.) APIS, LIFE, AND DEATH OF, &c. The bull, Apis, however much honoured in his life, was not permitted to exceed a myſterious term fixed for his death. "Apis," ſays Pliny, "cannot

not live beyond a certain number of years. When he has attained that period, they drown him in the fountain of the prieſts; for it is not permitted, adds, Ammianus Marcellinus, to let him prolong his life beyond the period preſcribed for him by the ſacred books." When this event happened, he was embalmed, and privately let down into the ſubterraneous places deſtined for that purpoſe. In this circumſtance, the prieſts announced that Apis had diſappeared; but when he died a natural death, before this period arrived, they proclaimed his death, and ſolemnly conveyed his body to the temple of Serapis. At Memphis was an ancient temple of Serapis, which ſtrangers were forbidden to approach, and where the prieſts themſelves only entered when Apis was interred. It was then, (ſays Plutarch) that they opened the gates called *Lethes* and *Cocytbe*, (of oblivion and lamentation,) which made a harſh and piercing ſound." Ammianus Marcellinus, and Solinus, paint with great energy the general deſpair of the Egyptians, who with cries and lamentations, demanded another Apis from heaven.

(5.) Apis, symbolical meaning of. According to Plutarch, the term preſcribed for the life of Apis, was 25 years; which number marked a period of the ſun, and of the moon, and the bull was conſecrated to theſe two bodies. Syncellius, in his Chronography, when he comes down to the 32d Pharaoh, called *Aſeth*, ſays, "Before Aſeth, the ſolar year conſiſted of 360 days. This prince added five to complete its courſe. In his reign, a calf was placed amongſt the gods, and named *Apis*." And in the Bibliotheca of Fabricius, we have the following paſſage: "It was cuſtomary to inaugurate the kings of Egypt at Memphis, in the temple of Apis. They were here firſt initiated in the myſteries, and were religiouſly inveſted; after which, they were permitted to bear the yoke of God, through a town to a place called the *Sanctuary*, the entrance of which was prohibited to the profane There they were obliged to ſwear that they would neither inſert months nor days in the year, and that it ſhould remain compoſed of 365 days, as had been eſtabliſhed by the ancients." From theſe facts, Mr Savary, in his letters on Egypt, infers, that Apis was the tutelary divinity of the new form given to the ſolar year, and of the cycle of 25 years, diſcovered at the ſame time. This deity, beſides, had a marked relation to the ſwelling of the Nile, as is teſtified by a great number of hiſtorians. The new moon which followed the ſummer ſolſtice, was the æra of this phenomenon, on which the eyes of every body were fixed: And Pliny ſpeaks as follows on this ſubject: "Apis had on his right ſide a white mark, repreſenting the creſcent; this mark (continues Ælian) indicated the commencement of the inundation." If Apis poſſeſſed the characteriſtic ſigns which proved his divine origin, he promiſed fertility and abundance of the fruits of the earth. It ſeems demonſtrated, therefore, Mr Savary adds, that this ſacred bull, the guardian of the ſolar year of 365 days, was alſo regarded as the genius who preſided over the overflowing of the river. The prieſts, by fixing the courſe of his life to 25 years, and by making the inſtallation of a new Apis, concur with the renewal of the period above mentioned, had probably perceived, as the reſult of long meteorological obſervations, that this revolution always brought about abundant ſeaſons.—Nothing was better calculated to procure a favourable reception of this emblematical deity from the people, ſince his birth was a preſage to them of a happy inundation, and of all the treaſures of teeming nature. The ſolemnity of his inauguration was called *Apparition*. That which was renewed every year towards the 12th or 13th of the month *Payn*, which correſponds with the 17th or 18th of June, was called *the birth of Apis*. It was a time of rejoicing, which Ælian deſcribes in the following manner: "What feſtivals! what ſacrifices take place in Egypt, at the commencement of the inundation! It is then that all the people celebrate the birth of Apis. It would be tedious to deſcribe the dances, the rejoicings, the ſhews, the banquets, to which the Egyptians abandon themſelves on this occaſion, and impoſſible to expreſs the intoxication of joy which breaks forth in all the towns of the kingdom." Theſe obſervations, Mr Savary thinks further confirmed by the name of this reſpectable bull; *Api*, in the Egyptian tongue, ſignifying number, meaſure.—This epithet perfectly characterizes an animal, eſtabliſhed as the guardian of the ſolar year, the type of the cycle of 25 years, and the preſage of a favourable inundation. Monſieur Huet, biſhop of Avranches, has endeavoured to prove that Apis was a ſymbolical image of the patriarch, Joſeph! and has ſupported his opinion with all his erudition. Dr Bryant apprehends that the name of *Apis* was an Egyptian term for a father; that it referred to the patriarch Noah; and that the creſcent which was uſually marked on the ſide of the animal, was a repreſentation of the ark.

(IV.) Apis, the bee, in zoology, a genus of inſects belonging to the order of inſecta hymenoptera. The mouth is furniſhed with two jaws, and a probocis infolded in a double ſheath; the wings are four in number, the two foremoſt covering thoſe behind when at reſt: In the anus or tail of the female and working bees, there is a hidden ſting. Theſe inſects are diſtinguiſhed into ſeveral ſpecies, each of which has its peculiar genius, talent, manners, and diſpoſition. Variety prevails in the order of their architecture, and in the nature of their materials. Some live in ſociety, and ſhare the toils; ſuch are the common bee. Others dwell and work in ſolitude, building the cradles of their families; as the leaf cutter bee does with the roſe tree leaf; the upholſterer with the gaudy tapeſtry of the corn roſe; the maſon bee with a plaſter, the wood piercer with ſaw duſt. All are employed in their little hermitage, with the care of providing for their offspring.—The ſpecies enumerated by Linnæus, are no fewer than 55; of which the following are the moſt remarkable:—

(1.) Apis brasilianorum, or pale red hairy bee, with the baſis of the thighs black. This is a very large bee, every where covered with a teſtaceous ſkin. It is a native of America.

(2.) Apis cariosa is a yellowiſh hairy bee; and the feet and front are of a bright yellow colour. It builds in the rotten trees of Europe.

(3.) Apis

(3.) APIS CENTUNCULARIS, leaf cutter, or black bee, having its belly covered with yellow down. The nests of this species are made of leaves, curiously plaited in the form of a matt or quilt.—There are several varieties of the leaf cutting bees, all equally industrious. They dig into the ground, and build their nests, of which some have the form and size of thimbles inserted one within another, others the size and shape of goose quills. These nests are composed of pieces of leaves. Each sort of bees cut into its own materials; some the rose tree leaf, others the horse chesnut. A careful observer may discover rose tree leaves, cut as it were, with a pinking iron; and there he may procure himself the pleasure of seeing with what dexterity a bee, destitute of any mathematical instrument, cuts out a circular piece, fit to be either the bottom or the lid of one of those nests; others it cuts out into ovals and semiovals, which form the sides of the nests, into each of which it deposits one egg with ready prepared victuals.

4. APIS DENTATA, or shining green bee, with black wings, and a kind of teeth on the hind thighs. The tongue of this bee is as long as its body.

5. APIS FERRUGINEA, or smooth black bee, with the feelers, mouth, belly, and feet, of an iron colour. This is a small bee, and supposed to be of an intermediate kind between the bee and wasp. is a native of Europe.

6. APIS FLORISOMNIS, or black bee with a cylindrical incurvated belly, having two tooth-like protuberances at the anus, and a kind of prickles on the hind legs. This bee sleeps in flowers; whence the name.

7. APIS LAPIDARIA, or red hairy bee, with a yellow anus, builds in holes of rocks.

8. APIS MELLIFICA, or domestic honey-bee. But the particulars concerning this valuable species are so numerous and interesting as to require a separate article for their detail; which the reader will therefore find at due length under the English name, BEE.

9. APIS MUSCORUM, or yellow hairy bee with a white belly, builds in mossy grounds. The skill displayed by these builders is admirable. In order to enjoy the pleasure of seeing their operations, let a nest be taken to pieces, and the moss conveyed to a distance. The bees will be seen to form themselves into a chain, from their nest to the place where the moss has been laid. The foremost lays hold of some with her teeth, clears it bit by bit with her feet (which circumstance has also procured them the name of *carding bees,*) then, by the help of her feet, she drives the unravelled moss under her belly; the second, in like manner, pushes it on to the third. Thus there is formed an uninterrupted chain of moss, which is wrought and interwoven with the greatest dexterity by those that abide by the nest; and that their nest may not be the sport of the winds, and may shelter them from rain, they throw an arch over it, which they compose with a kind of wax, tentaceous, though thin in substance, which is neither the unwrought bees wax nor the real wax. Dissolved in oil of turpentine, it may be used in taking off impressions.

10. APIS ROSTRATA is distinguished by the upper lip being inflected and of a conical shape, and by the belly being invested with bluish belts They build their nests in high sandy grounds, and there is but one young in each nest.

11. APIS TERRESTRIS is black and hairy, with a white belt round the breast, and a white anus; it builds its nest very deep in the earth.

12. APIS VARIEGATA: The breast and belly are variegated with white and black spots; the legs are of an iron colour. It is a native of Europe. This species sleeps in the geranium phæum, or spotted crane's bill.

13. APIS VIOLACEA is a red bee, and very hairy, with bluish wings. It is a native of Europe. The violacea is said to perforate trees, and hollow them out in a longitudinal direction: they begin to build their cells at the bottom of these holes, and deposite an egg in each cell, which is composed of the farina of plants, and honey or a kind of gluten.

* APISH. *adj.* [from *ape.*] 1. Having the qualities of an ape; imitative.—

Report of fashions in proud Italy,
Whose manners still are tardy, *apish* nation
Limps after, in base aukward imitation.
Shakespeare.

2. Foppish; affected.—

Because I cannot flatter, and look fair,
Duck with French nods and *apish* courtesy,
I must be held a rancorous enemy. *Shak.*

3. Silly: trifling; insignificant.—All this is but *apish* sophistry; and, to give it a name divine and excellent, is abusive and unjust. *Glanville.* 4. Wanton; playful.—

Gloomy sits the queen;
Till happy chance reverts the cruel scene;
And *apish* folly, with her wild resort
Of wit and jest, disturbs the solemn court.
Prior.

* APISHLY. *adv.* [from *apish.*] In an apish manner; foppishly; conceitedly.

* APISHNESS. *n. f.* [from *apish.*] Mimickry; foppery; insignificance; playfulness.

APITCOMB, a small town in Somersetshire, near Castle-Carey.

APITES, APITIS VINUM, [from ἀπίον, the *pear-tree,*] perry, wine of pears. It is thus prepared by some: Cut and pound the pears, and having pressed out the juice, to every 12 pints thereof add one pint of honey, and let them ferment.

* APITPAT. *adv.* [a word formed from the motion.] With quick palpitation.—O there he comes—Welcome my bully, my buck: agad, my heart has gone *apitpat* for you. *Congreve.*

(I.) APIUM, PARSLEY: A genus of the digynia order, belonging to the pentandria class of plants; and in the natural method ranking under the 45th order, *Umbellatæ.* The fruit is of an oval shape, and streaked; the involucrum consists of one leaf; and the petals are inflected. There are only two species, the culture of which is well known, viz:

1. APIUM GRAVEOLENS, or smallage, a native of Britain; and

2. APIUM PETROSELINUM, or common parsley, a native of Sardinia.

(II.) APIUM, MEDICINAL USES OF, &c. The roots and seeds of the *petroselinum* are used in medicine. The root of parsley is one of the five aperient roots, and in this intention is sometimes made an ingre-

ingredient in apozems and diet drinks; if liberally uſed, it is apt to occaſion flatulencies; and thus, by diſtending the viſcera, produces a contrary effect to that intended by it: the taſte of this root is ſomewhat ſweetiſh, with a light degree of warmth and aromatic flavour. The ſeeds are an ingredient in the electuary of bay berries.—The roots of *ſmallage* are alſo in the number of aperient roots, and have been ſometimes preſcribed as an ingredient in aperient apozems and diet-drinks, but are at preſent diſregarded. The ſeeds of the plant are moderately aromatic, and were formerly uſed as carminatives; in which intention they are, doubtleſs, capable of doing ſervice, though the other warm ſeeds, which the ſhops are furniſhed with, render theſe unneceſſary; and accordingly the Edinburgh college, which retains the roots, has expunged the ſeeds. The common parſley is alſo reckoned an effectual cure for the rot in ſheep, provided they are fed with it twice a week, for two or three hours each time; but hares and rabbits are ſo fond of this herb, that they will come from a great diſtance to feed upon it; and in the countries where theſe animals abound, they will deſtroy it if not very ſecurely fenced againſt them; ſo that whoever has a mind to have plenty of hares in their fields, may draw them from all parts of the country by cultivating parſley.

APIVORUS, in ornithology, a ſynonime of a ſpecies of falco. See FALCO.

APLANATIC, a term applied to that kind of refraction which completely corrects the abberration of the rays of light, and the colour depending thereon, in contradiſtinction to ACHROMATIC, in which there is only a partial correction of colour.

APLANES [ἀπλανὴς, Gr. not wandering,] 1. The fixed ſtars, ſo called in oppoſition to the wandering ſtars, or planets. 2. The ſpheres.

APLUDA, a genus of the monœcia order, belonging to the polygamia claſs of plants; and in the natural method ranking under the 4th order, *Gramina*. The calyx is a bivalved gluma; the floſcules of the female are ſeſſile, and the male floſcules are furniſhed with pedunculi; the female has no calyx; the corolla has a double valve; there is but one ſtylus, and one covered ſeed. The male has three ſtamina. There are three ſpecies, viz.

1. APLUDA ARISTATA,
2. APLUDA MUTICA, and
3. APLUDA ZENGITES,

All natives of the Indies.

* APLUSTRE. *n. ſ.* [Latin.] The ancient enſign carried in ſea veſſels.—The one holds a ſword in her hand, to repreſent the Iliad, as the other has an *apluſtre*, to repreſent the Odyſſey, or voyage of Ulyſſes. *Addiſon.*

APNOE, [from ἀ and πνέω, *I breathe,*] in medicine, a want of breath, or loſs of reſpiration. In this ſenſe is the word uſed among the ancients, not as importing a total deprivation of breath, which would be another name for death; but to denote the reſpiration very ſmall and ſlow, ſo as to ſeem quite gone, as is the caſe in ſuffocation of the *uterus*, apoplexies, ſyncopes, lethargies, &c.

APOBAMINA is uſed by phyſicians for a liquor wherein pieces, or chains of gold, heated red hot, have been extinguiſhed, in order to fortify the ſpirits and principal members.

APOBATANA, the metropolis of Media, where the kings kept their treaſure; ſuppoſed to be the ſame with ECBATANA.

APOBATERION, [from ἀποβαίνω, *I depart,*] among the ancients, a farewel ſpeech or poem, made by a perſon on his departure out of his own country, or ſome other place where he had been kindly received and entertained. Such is that of Æneas to Helenus and Andromache, Æn. lib. iii.

APOBATHRA, a place near Seſtos, the landing place where Xerxes's ſhips were frozen and ſtuck in the ice.

APOBATHRÆ, in antiquity, a kind of little bridges, or ſtairs joining the land to ſhips, or one ſhip to another.

APOBEE, in botany, the name given by the natives of Guinea to a ſpecies of corn-marygold, called by Petiver Chryſanthemum *acaulon Guineenſe foliis longis anguſtis*, from its having long and narrow leaves, and no ſtalk to ſupport the flower. The people of the place uſe this in the ſmall-pox, and other eruptive fevers, boiled in water, and the liquor drank warm.

APOBOMIOI, [from ἀπὸ, below, and βωμὸς, altar,] in antiquity, ſacrifices offered on the bare earth without altars.

APOCALISM. See APOCHALISMA.

(1.) * APOCALYPSE. *n. ſ.* [from ἀποκαλύπτω.] Revelation; diſcovery: a word uſed only of the ſacred writings.—

O for that warning voice, which he who ſaw
Th' *apocalypſe*, heard cry in heav'n aloud. *Milt.*

(2.) APOCALYPSE, [from ἀποκαλύπτω, to reveal:] REVELATION, the name of the laſt of the ſacred books of the New Teſtament, containing an account of the viſions which John ſaw in the iſland of Patmos, whither he had been baniſhed by the emperor Domitian. According to Iræneus it was written about A. D. 96; but Sir Iſaac Newton places the writing of it earlier, viz. in the time of Nero. Some attribute this book to the arch-heretic Cerinthus; but the ancients unanimouſly aſcribe it to John, the ſon of Zebedee, and brother of James, whom the Greek fathers call the Divine, by way of eminence, to diſtinguiſh him from John the Baptiſt, &c. This book has not, at all times, been eſteemed canonical. There were many churches in Greece, as St Jerome informs us, which did not receive it; neither is it in the catalogue of canonical books prepared by the council of Laodicea, nor in that of St Cyril of Jeruſalem; but Juſtin, Irenæus, Origen, Cyprian, Clemens of Alexandria, Tertullian, and all the fathers of the fourth, fifth, and the following centuries, quote the revelation as a book then acknowledged to be canonical. The Alogians, Marcionites, Cerdonians, and Luther himſelf, rejected this book; but the Proteſtants have forſaken Luther in this particular; and Beza has ſtrongly maintained againſt his objections, that the Apocalypſe is authentic and canonical.

(3.) APOCALYPSE, REVELATION. This book is ſo entitled, becauſe the import, deſign, and meaning of the language and figures uſed under the Old Teſtament, (which Biſhop Newton and

other commentators have obſerved, are here borrowed, from the beginning to the end,) are all here revealed. For inſtance, would we know the deſign of the high prieſt being ſo richly and particularly arrayed under the Old Teſtament, it is *ſignified* by the perſon whom John was called to behold in his firſt viſion, chap. i. And we may add, that in this viſion not only is the prieſtly office completely filled up, but alſo the prophetic and the kingly. The predictions under the Old Teſtament centre in what is here predicted; the power exerciſed of old, ruling among the nations, centres in him whoſe voice is as the ſound of *many waters*. John is commanded to ſend an account of this viſion, with a particular addreſs, (chap. ii. & iii.) to each of the ſeven churches in Aſia Minor. What is ſaid to theſe churches, as to the errors among them, not only points us back to the Old Teſtament for the foreſhewing of theſe errors; but in their then ſtate there was a *ſignifying* of the appearance the church would make internally in ſeven ſucceſſive periods, from the aſcenſion of Chriſt till his coming again in glory. Again, language and figures are borrowed from the hiſtory of the church of old among the nations, the meaning of which was revealed in the appearance the church was to make during the ſame ſeven periods, connected with the nations, as exhibited to John, in three diſtinct and different points of view, viz. 1. under the ſeals; 2. under the trumpets; and, 3. under the vials. But, in order to illuſtrate more fully ſome particular types, ſuch as the hiſtory of Elijah, which had been only generally noticed before, ſeveral ſeparate viſions are introduced and deſcribed;—altogether laying open the myſtery of every enemy of the people of God, as Sodom, Egypt, and Babylon, with their puniſhments; all connected in the vengeance on ſpiritual Babylon. And though in this varied view of the tranſactions on the ſtage of this world, we ſee the church in a ſtate of ſuffering according to her corruptions pointed at in the ſeven addreſſes, yet the draught is never completed till, like Iſrael from Egypt, or the captives from Babylon, ſhe is repreſented triumphing over her enemies and perſecutors: ſee chap. vii. 9. ult. xi. 15. ult. xiv. xv. and xix. to the end of the book.—If Sir Iſaac Newton had cauſe to ſay, in his time, "there is already ſo much of the prophecy fulfilled, that as many as will take pains in this ſtudy may ſee ſufficient inſtances of God's providence," how much more have we?

(4.) APOCALYPSES, VARIOUS. There have been ſeveral other works publiſhed under the title of *Apocalypſes*. Sozoman mentions a book uſed in the churches of Paleſtine, called the *Apocalypſe*, or *Revelation of St Peter*. He alſo mentions an Apocalypſe of St Paul; which the Cophtæ retain to this day. Euſebius alſo ſpeaks of both theſe Apocalypſes. St Epiphanius mentions an Apocalypſe of Adam; Nicephorus, an Apocalypſe of Eſdras; Gratian and Cedrenus, an Apocalypſe of Moſes, another of St Thomas, and another of St Stephen; St Jerom, an Apocalypſe of Elias. Porphyry, in his life of Plotin, makes mention of the Apocalypſe or Revelations of Zoroaſter, Zoſtrian, Nicothæus, Allogenes, &c.

* APOCALYPTICAL. *adj.* [from *apocalypſe*.] Concerning revelation; containing revelation,—If we could underſtand that ſcene, at the opening of this *apocalyptical* theatre, we ſhould find it a repreſentation of the majeſty of our Saviour.—*Burnet's Theory of the Earth.*

* APOCALYPTICALLY. *adv.* [from *apocalyptical*.] In ſuch a manner as to reveal ſomething ſecret.

APOCARITES, [from ἀποκείρω, I cut off,] in eccleſiaſtical hiſtory, denote thoſe who aſſerted that the human ſoul is part of, or derived from, the ſubſtance of God. They are ranked as a branch of the Manicheans.

APOCARPASUM, in natural hiſtory, a name given by the ancient Greeks to a poiſonous drug, called alſo ſometimes ſimply *carpaſum*. It was the exudation of a tree growing in the country of the Abyſſines, and was ſo like the fineſt myrrh, that it was often mixed with it, and many lives were loſt by adminiſtering it as myrrh. The wood of the tree which produced it was alſo poiſonous, though in a leſs degree.

(1.) APOCATASTASIS, [from ἀποκαθίστημι, I reſtore,] denotes the entire reſtitution, or redintegration of a thing. In this ſenſe, we read of the apocataſtaſis of the world, or of all things.

(2.) APOCATASTASIS, in aſtronomy, the period of a planet, or the time wherein it returns to the ſame point of the zodiac from which it ſet out.

(3.) APOCATASTASIS, in medicine, the ſubſiding or ſinking of a thing; ſuch as, of tumours, &c.

APOCATHARSIS, the ſame with CATHARSIS, or expurgation.

APOCHA, [from ἀπὸ and ἔχω, I have,] in civil law, an acquittance, or receipt given by the creditor to his debtor for money paid; in which ſenſe the word ſtands contradiſtinguiſhed from antapocha, which is given by the debtor to the creditor.

APOCHALISMA, } [from ἀπὸ and χυλίζω, I ex-
APOCHYLISMA, } tract the juice,] in pharmacy, the inſpiſſated juice of vegetables.

APOCLASM, in ſurgery, the breaking off of any part of the body.

* APOCOPE. *n. ſ.* [ἀποκοπή.] A figure in grammar, when the laſt letter or ſyllable of a word is taken away; as, *ingeni*, for *ingenii*; *apoplex*, for *apoplexy*.

APOCRISARIUS, or } [from ἀποκρίνομαι, an-
(1.) APOCRISIARIUS, } ſwer,] in antiquity, an officer appointed to deliver the meſſages, orders, and anſwers, of a prince or emperor. He was alſo the emperor's chancellor, and kept the ſeal. Zozimus defines *apocriſiarius*, ſecretary for foreign affairs; being the ſame with what Vopiſcus, in the life of Aurelian, calls *notarius ſecretorum*.

(2.) APOCRISIARIUS, in eccleſiaſtical affairs, was appropriated to the pope's deputy, who reſided at Conſtantinople to receive the pope's orders, and the emperor's anſwer. St Gregory was apocriſiary of pope Pelagius, when he compoſed his morals on Job. The apocriſiary did the office of the modern *nuncio*. Sometimes he held the rank of the pope's *legate*. The inſtitution of the office ſeems to have been in the time of Conſtantine, or not long after, when the emperors being become Chriſtians, foreign churches had more occaſion to promote their ſuits at court. We find the office eſtabliſhed by law in the time of Juſtinian. It was ordered, that as no biſhop was to be long

long abſent from his church without ſpecial command from the emperor, if any one had occaſion to negociate any eccleſiaſtical cauſe at court, he ſhould prefer his petition by the apocriſiarius of his church. Almoſt every monaſtery had its *apocriſiarius* likewiſe, whoſe buſineſs was not to reſide in the royal city, as the former did, but to act as proctors for their monaſtery, or any member of it, when they had occaſion to enter any appearance at law, before the biſhop, under whoſe juriſdiction they were. The hereſies of the Monothelites, and the Iconoclaſts, broke off the cuſtom of having a papal apocriſiary at Conſtantinople.

APOCRISIA, in phyſic, the ejection of ſuperfluities out of the body.

APOCRISIS, [ἀποκρισις,] literally denotes an anſwer. Under this denomination were anciently included, not only the reſcripts of the emperors to the petitions of parties, but all kinds of decrees or mandates. We have ſeveral books extant under the title of *Apocriſes*.

(1.) * APOCRUSTICK. *adj.* [ἀποκρουστικα, from ἀποκρουω, to drive.] Remedies endued with a repelling and aſtringent power, by which they prevent the too great afflux of humours. *Chalmers.*

(2.) APOCRUSTICS. See REPELLENTS.

(1.) * APOCRYPHA *n. ſ.* [from ἀποκρυπτω, to put out of ſight.] Books not publickly communicated; books whoſe authors are not known. It is uſed for the books appended to the ſacred writings, which, being of doubtful authours, are leſs regarded.—We hold not the *apocrypha* for ſacred, as we do the holy ſcripture, but for human compoſitions. *Hooker.*

(2.) APOCRYPHA, or APOCRYPHAL BOOKS, are not admitted into the canon of ſcripture, being either ſpurious, or at leaſt not acknowledged as divine. When the Jews publiſhed their ſacred books, they gave the appellations of *canonical* and *divine* only to ſuch as they then made public: ſuch as were ſtill retained in their archives they called *apocryphal*, for no other reaſon but becauſe they were concealed, or not made public; ſo that they might be really ſacred or divine, though not promulgated as ſuch. Thus, in reſpect of the Bible, all books were called *apocryphal* which were not inſerted in the Jewiſh canon of ſcripture. Voſſius obſerves, that, with regard to the ſacred books, none are to be accounted apocryphal except ſuch as had neither been admitted into the ſynagogue nor the church, ſo as to be added to the canon, and read in public. The Proteſtants not only reckon thoſe books apocryphal which are eſteemed ſuch in the church of Rome, as the prayer of Manaſſeh king of Judah, the IIId and IVth books of Eſdras, St Barnabas's epiſtle, the book of Hermos, the addition at the end of Job, and the 151ſt pſalm; but alſo Tobit, Judith, the reſt of Eſther, the Wiſdom of Solomon, Baruch, Eccleſiaſticus, the Song of the Three Children, the ſtory of Suſannah, and of Bel and the Dragon, and the Iſt and IId books of Maccabees. It is now pretended that theſe books were not received by the Jews, or ſo much as known to them But this is not credible. They ſeem, moſt of them, to have been wrote by Jews. But none of the writers of the New Teſtament cite or mention them: neither Philo nor Joſephus ſpeak of them. The Chriſtian church was for ſome ages a ſtranger to them. Origen, Athanaſius, Hilary, Cyril of Jeruſalem, and all the orthodox writers, who have given catalogues of the canonical books of ſcripture, unanimouſly concur in rejecting theſe out of the canon. The Proteſtants acknowledge ſuch books of ſcripture only to be canonical as were eſteemed to be ſo in the firſt ages of the church; ſuch as are cited by the earlieſt writer among the Chriſtians as of divine authority, and after the moſt diligent enquiry were received and judged to be ſo, by the council of Laodicea. The apocryphal books, however, according to the ſixth article of the church of England, are to be read for example of life and inſtruction of manners; but it doth not apply them to eſtabliſh any doctrine: nor is even this uſe made of them by the other reformed churches See BARUCH, ESDRAS, TOBIT, &c.

* APOCRYPHAL. *adj.* from *apocrypha*.] 1. Not canonical; of uncertain authority.—Jerom, who ſaith, that all writings not canonical are *apocryphal*, uſes not the title *apocryphal* as the reſt of the fathers have done, whoſe cuſtom is to name, for the moſt part, only ſuch as might not publickly be read or divulged. *Hooker.* 2. Contained in the apocrypha.—To ſpeak of her in the words of the *apocryphal* writers, wiſdom is glorious, and never fadeth away. *Addiſon.* 3. It is ſometimes uſed for an account of uncertain credit.

* APOCRYPHALLY. *adv.* [from *apocryphal.*] Uncertainly; not indiſputably.

* APOCRYPHALNESS. *n. ſ.* [from *apocryphal.*] Uncertainty; doubtfulneſs of credit.

APOCYMA, [from απο and κυμα, wave,] in the materia medica of the ancients, a name given by the Greek authors to a ſort of cement, uſed to daub over the bottoms of their ſhips, to preſerve them from injuries by the water; they called this alſo by the name of *zopiſſa*, and Avicenna and Serapion call it *ketran*, *kittran*, or *alkitrum*. It was a mixture of bees-wax and pitch melted together, and after it had been ſoaked ſometime in the ſea-water, it was ſuppoſed to have peculiar virtues, and was uſed in many compoſitions.

(1.) APOCYNUM, [Αποκυνον of απο and κυων, a dog, becauſe the ancients believed this plant would kill dogs,] DOGSBANE: A genus of the digynia order, belonging to the pentandria claſs of plants; and in the natural method ranking under the 30th order *Contortæ*. The eſſential characters are: The corolla is bell-ſhaped; and the filaments are five, alternate with the ſtamina. Of this genus botanical writers enumerate 11 ſpecies; of which the following are the moſt remarkable:

(1.) APOCYNUM CORDATUM has a climbing ſtalk, and was diſcovered, along with the Villoſum, (See N° 4.) at La Vera Cruz in New Spain, by Dr William Houſton, who ſent their ſeeds to England. They are both climbers and mount to the tops of the talleſt trees. In England they have climbed over plants in the ſtoves, and riſen to upwards of 20 feet high. The cordatum has produced flowers ſeveral times: but the villoſum never ſhowed an appearance of any.

2. APOCYNUM SPECIOSSIMUM has large flowers, and is a native of Jamaica and of Savannah, whence it has the name of *Savannah flower*, by which it is generally known in Jamaica. It

rifes 3 or 4 feet high, having woody ſtalks which ſend out a few lateral branches, garniſhed with ſmooth oval leaves, placed by pairs oppoſite, of a ſhining green colour on the upper ſides, but pale and veined underneath. The flowers are produced from the ſides of the branches, upon long foot-ſtalks: there are commonly 4 or 5 buds at the end of each; but there is ſeldom more than one of them which comes to the flower. The flower is very large, having a long tube which ſpreads open wide at the top, of a bright yellow, and makes a fine appearance, eſpecially in thoſe places where the plants grow naturally, being moſt part of the year in flower.

3. APOCYNUM VENETUM has an upright herbaceous ſtalk, and grows on a ſmall iſland in the ſea near Venice, but is ſuppoſed to have been originally brought from ſome other country. There are two varieties of this; one with a purple, and the other with a white flower. The roots creep very much, and by them only it is propagated; for it ſeldom produces any ſeeds either in the gardens where it is cultivated, or in thoſe places where it grows naturally. Mr Miller tells us, that he had been aſſured by a very curious botaniſt, who reſided many years at Venice, and conſtantly went to the ſpot ſeveral times in the ſeaſon to procure the ſeeds, had any been produced, that he never could find any pods formed on the plants. The ſtalks riſe above two feet high, and are garniſhed with ſmooth oval leaves placed oppoſite; the flowers grow at the top of the ſtalks, in ſmall umbels, and make a very pretty appearance. The flowers appear in July and Auguſt. This ſpecies is hardy enough to live in England in the open air, provided it is planted in a warm ſituation and dry ſoil. The beſt time for removing and planting its roots is in ſpring, juſt before they begin to puſh out new ſtalks.

4. APOCYNUM VILLOSUM, a native of Vera Cruz. (See N° 1.) This and the two firſt ſpecies are propagated by ſeeds, but are ſo tender as to require being kept conſtantly in a ſtove.

(11.) APOCYNUM, USES OF THE. All the ſpecies of this plant abound with a milky juice, which flows out from any part of their ſtalks and leaves when they are broken: this is generally ſuppoſed to be hurtful if taken inwardly, but doth not bliſter the ſkin when applied to it, as the juice of ſpurge and other acrid plants do. The pods of all the ſorts are filled with ſeeds, which are for the moſt part compreſſed and lie over one another *imbricatim*, like the tiles of a houſe; theſe have each a long plume of a cottony down faſtened to their crowns, by which, when the pods are ripe and open, the ſeeds are wafted by the wind to a a conſiderable diſtance, ſo that the plants become very troubleſome weeds. This down is in great eſteem in France, for ſtuffing of eaſy chairs, making of quilts, &c. for it is exceedingly light and elaſtic. It is called by the French *delawad*; and might probably become a vendible commodity in England, were people attentive to the collecting of it in Jamaica where the plants are found in plenty.

APODAGRYTICA, [from ἀπο and δακρυ, a tear,] in pharmacy, medicines proper to excite tears. Some alſo uſe the term for remedies proper to ſuppreſs tears.

APODECTÆ, from ἀποδεχομαι, I receive,] in antiquity, a denomination given to ten general receivers, appointed by the Athenians, to receive the public revenues, taxes, debts, and the like. The apodectæ had alſo a power to decide controverſies ariſing in relation to money and taxes, all but thoſe of the moſt difficult nature and higheſt concern, which were reſerved to the courts of judicature.

APODECTÆI, in the Athenian government, officers appointed to ſee that the meaſures of corn were juſt.

APODEMICA, [from ἀποδημεω, I travel,] the doctrine or ſcience of travelling, either for knowledge or devotion. J. Meraker publiſhed an *Apodemica*, and Ranzovius a *Methodus apodemica*.

(1.) APODES, in a general ſenſe, [from α, and πους,] denotes things without feet. Zoologiſts apply the name to a fabulous ſort of birds, ſaid to be found in ſome of the iſlands of the new world, which being entirely with feet, ſupport themſelves on the branches of trees, by their crooked bills. The Germans and Dutch have alſo their *apodes*, a ſort of birds, ſomewhat like ſwallows, whoſe legs and feet are ſo very ſmall, that they ſeem rather formed for creeping than running.

(2.) APODES, in the Linnæan ſyſtem, the name of the firſt order of fiſhes, or thoſe which have no belly fins. See ZOOLOGY.

APODICTIC. See next article.

* APODICTICAL, *adj.* [from ἀποδειξις, evident truth; demonſtration.] Demonſtrative; evident beyond contradiction.—Holding an *apodictical* knowledge, and an aſſured knowledge of it; verily, to perſuade their apprehenſions otherwiſe, were to make an Euclid believe, that there were more than one centre in a circle. *Brown's Vulgar Errours.*

(1.) APODIOXIS, in logic, [from ἀποδιωκω, to exclude,] the rejection of ſuch things as do not neceſſarily belong to the queſtion to be conſidered.

(2.) APODIOXIS, in rhetoric, a figure whereby we either paſs over a thing ſlightly, or refer treating of it to ſome other time or place. It is called by Latin writers, *rejectio*; e.g. *Quid ego ſenatum defendam, judices? Equidem debeo, &c.*

(1.) * APODIXIS. *n. ſ.* [ἀποδειξις.] Demonſtration. *Dict.*

(2.) APODIXIS, in rhetoric, an evident proof of a point. We have ſeveral books extant under the names of *apodixes*, and ſome by way of anſwer to theſe, under that of *antapodixes*.

(3.) APODIXIS, in writers of the middle age, a receipt for money paid.

APODOSIS, [from ἀποδιδωμι, I apply, in rhetoric,] makes the third part of a complete exordium, being properly the application, or reſtriction of the protaſis. The apodoſis is the ſame with what is otherwiſe called *axioſis*, and ſtands oppoſed to protaſis; e.g. *(protaſis,)* all branches of hiſtory are neceſſary for a ſtudent; *(apodoſis,)* ſo that without theſe, he can never make any conſiderable figure; *(apodoſis,)* but the laſt before is of a more ſpecial uſe, which commends it &c. Apodoſis is alſo uſed, in ſpeaking of fines, for that part which makes the application of the

APODYTERIM, [from ἀποδυω, to undreſs,]

in antiquity, an apartment at the entrance of baths, wherein perſons dreſſed and undreſſed.

* APOGÆON. } *n. ſ.* [from απο, from, and
* APOGEE. } γη, the earth] A point in the
* APOGEUM. } heavens, in which the ſun, or a planet, is at the greateſt diſtance poſſible from the earth in its whole revolution. The ancient aſtronomers regarding the earth as the centre of the ſyſtem, chiefly regarded the apogæon and perigæon, which the moderns, making the ſun the centre, change for the aphelion and perihelion. *Chambers.*—It is not agreed in what time, precisely, the *apogeum* abſolveth one degree. *Brown.*

(1.) APOGRAPHE, [from απο, and γραφω, to write,] a copy or tranſcript of ſome book or writing. *Apograph* ſtands oppoſed to *autograph*, as a copy to an original.

(2.) APOGRAPHE, in ancient law, was, when a perſon, being ſued for money ſuppoſed due to the public, pleaded that the charge was unjuſt, and withal produced all the money he was poſſeſſed of, and declared how it came to his hands.

(3.) APOGRAPHE, or APOGRAPHON, in the Roman law, a catalogue, or inventory of goods

To APOKEPHALIZE. *v. a.* [from απο, from, and κεφαλη, the head,] to behead, or in more modern language, to guillotine.

APOLEPSIA. See APOLEPSIS, N° 1.

(1.) APOLEPSIS, [from απολαμβανω, I retain,] in the ancient phyſic, a retention of urine, or any other matter, which ought to be evacuated. The word is alſo applied to an interception of the blood or ſpirits, or an extinction of the native heat of the veins. It is alſo uſed for a ſpecies of apoplexy, wherein the ſpeech, ſenſe, motion, &c. ſuddenly fail; and coincides with what is called a catalepſis.

(2.) APOLEPSIS, [from απολειπω, I leave,] in the Athenian law, an action of divorce; brought when a woman had fled from her huſband.

APOLEPSY. See APOLEPSIS, N° 1.

APOLIDES, in antiquity, [from α, negative, and πολις, a city,] perſons condemned for life to the public works, or exiled into ſome iſland, and thus diveſted of the privileges of Roman citizens.

APOLLINARES LUDI, in antiquity, a general name given to all ſcenical games. They were alſo called *ludi liberales*, and *ſcenici*. They differed from the *ludi theatrales*, in that the former were celebrated with all ſorts of plays, farces, poems, recitations, &c. the latter only by dancing and muſic. This kind of Apollinarians had their ſhare in almoſt all the ſolemn games. See next article.

APOLLINARIAN GAMES, in Roman antiquity, were inſtituted in the year of Rome 542. The occaſion was a kind of oracle, delivered by the prophet Marcus, after the fatal battle at Cannæ, declaring, that to expel the enemy, and cure the people of an infectious diſeaſe, which then prevailed, ſacred games were to be annually performed in honour of Apollo; the prætor to have the direction of them, and the decemviri to offer ſacrifices after the Grecian rite. The ſenate ordered that this oracle ſhould be obſerved the rather, becauſe another prophecy of the ſame Marcus, wherein he had foretold the overthrow at Cannæ, had come true; for this reaſon, they gave the prætor 12,000 aſes out of the public funds, to defray the ſolemnity. There were ſacrificed an ox to Apollo, and two white goats and a cow to Latona; all with their horns gilt. Apollo had alſo a collection made for him, beſides what the people who were ſpectators, gave voluntarily.—The firſt prætor by whom they were held, was P. Cornelius Sylla. For ſome time, they were moveable or indictive; but at length were fixed, under P. Licinius Varus, to the 5th of July, and made perpetual. The men, who were ſpectators at theſe games, wore garlands on their heads; the women performed their devotions in the temples at the ſame time, and at laſt they caroused together in the veſtibules of their houſes, the doors ſtanding open. The Apollinarian games were merely ſcenical; and at firſt only obſerved with ſinging; piping, and other ſorts of muſic; but afterwards, there were alſo introduced all manner of mountebank tricks, dances, and the like; yet ſo as that they ſtill remained ſcenical, no chariot races, wreſtling, or the like laborious exerciſes of the body, being ever practiſed at them.

APOLLINARIANS, or APOLLINARISTS, called alſo by Epiphanius DIMARITÆ, ancient heretics, who denied the proper humanity of Chriſt, and maintained that the body which he aſſumed was endowed with a ſenſitive, and not a rational, ſoul, but that the Divine Nature ſupplied the place of the intellectual principle in man. This ſect derived its name from APOLLINARIS, biſhop of Laodicea. (See N° 1.) The Apollinarians have been charged with other opinions, ſuch as the Millenarian and Sabellian, the pre-exiſtence of the body of Chriſt, and the paſſion of his Deity; but eccleſiaſtical writers are not agreed with reſpect to theſe and other particulars. Their doctrine was firſt condemned by a council of Alexandria, in 362, and afterwards in a more formal manner, by a council at Rome, in 375; and by another council in 378, which depoſed Apollinaris from his biſhopric. Notwithſtanding all theſe cenſures, his doctrine ſpread through moſt of the churches of the eaſt; and his followers were ſubdivided into various ſects. In 388, the emperor Theodoſius enacted a law, forbidding them to hold aſſemblies, to have any eccleſiaſtics or biſhops, or to dwell in cities! The rigorous execution of this law, in concurrence with the decrees of different councils, reduced them to a very ſmall number, and their doctrine and ſect dwindled away.

(1.) APOLLINARIS, a biſhop of Laodicea, in the 4th century, who was depoſed for his heretical opinions, A. D. 378. See laſt article.

(2.) APOLLINARIS, Caius Sulpicius, a very learned grammarian, born at Carthage, lived in the 2d century, under the Antonines; he is ſuppoſed to be the author of the verſes which are prefixed to the comedies of Terence, and contain the arguments of them. He had for his ſucceſſor, in the profeſſion of grammar, Helvius Pertinax, who had been his ſcholar, and was at laſt emperor.

(3.) APOLLINARIS SIDONIUS, Caius Lollius, an eminent Chriſtian writer and biſhop in the 5th century, was born of a noble family in France. He was educated under the beſt maſters, and made a prodigious progreſs in the ſeveral arts and ſciences, and particularly in poetry and polite literature.—

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After he had left the ſchools, he applied himſelf to the profeſſions of war. He married Papianilla, the daughter of Avitus, who was conſul, and afterwards emperor, by whom he had 3 children. But Majorianus, in the year 457, having deprived Avitus of the empire, and taken the city of Lyons, in which our author reſided, Apollinaris fell into the hands of the enemy. However, the reputations of his learning ſoftened Majorianus's reſentments, ſo that he treated him with the utmoſt civility, in return for which Apollinaris compoſed a panegyric to his honour; which was ſo highly applauded, that he had a ſtatue erected to him at Rome, and was honoured with the title of *Count*. In the year 467 the emperor Anthemius rewarded him for the panegyric, which he had written in honour of him, by raiſing him to the poſt of governor of Rome, and afterwards to the dignity of a patrician and ſenator, and erecting a ſtatue to him. But he ſoon quitted theſe ſecular employments for the ſervice of the church. The biſhopric of Clermont being vacant, in 472, by the death of Eparchus, Apollinaris, who was then only a layman, was choſen to ſucceed him without any intereſt or ſolicitation on his part, in which ſee he acted with the greateſt integrity. Clermont being beſieged by the Goths, he animated the people to the defence of that city, and would never conſent to the ſurrender of it; ſo that, when it was taken about the year 480, he was obliged to retire; but he was ſoon reſtored by Evariges king of the Goths, and continued to govern the church as he had done before. He died in 487; and his feſtival is ſtill obſerved in the church of Clermont, where his memory is had in great veneration. He is eſteemed the moſt elegant writer of his age, both in proſe and verſe. He wrote a great many little pieces; but preſerved none but thoſe which he thought were worthy of being continued down to poſterity. He collected himſelf the 9 books which remain of his letters.

(4.) APOLLINARIS, in botany, a name given by ſome authors to henbane.

(1.) APOLLINARIUS, Claudius, a learned biſhop of Hierapolis, who, about the year 170, preſented to Marcus Aurelius, an excellent Apology for the Chriſtians.

(2.) APOLLINARIUS, THE YOUNGER, thus called to diſtinguiſh him from his father, was at firſt lector or reader of Laodicea, and afterwards biſhop of that city. He was univerſally eſteemed the greateſt man of his age, both for learning and piety, and a moſt accurate and nervous defender of the faith againſt all its enemies: but notwithſtanding this, on his advancing ſome opinions that were not approved, he was anathematized as an *heretic* by the ſecond general council of Conſtantinople in 381!

(1.) APOLLO, in mythology, a pagan deity worſhipped by the Greeks and Romans. Cicero mentions four of the name: the moſt ancient of whom was the ſon of Vulcan; the ſecond a ſon of Corybas, and born in Crete; the third an Arcadian, called *Nomian*, from his being a great legiſlator; and the laſt, to whom the greateſt honour is aſcribed, the ſon of Jupiter and Latona.—Apollo had a variety of other names, either derived from his principal attributes, or the chief places where he was worſhipped. He was called the *Healer* from his enlivening warmth and cheering influence; *Pæan*, from the peſtilential heats: to ſignify the former, the ancients placed the graces in his right hand; and for the latter, a bow and arrows in his left: *Nomius*, or the ſhepherd, from his fertilizing the earth, and thence ſuſtaining the animal creation; *Delius*, from his rendering all things manifeſt: *Pythius*, from his victory over Python; *Lycius*, *Phœbus*, and *Phaneta*, from his purity and ſplendor. As Apollo is almoſt always confounded by the Greeks with the ſun, it is no wonder that he ſhould be dignified with ſo many attributes. It was natural to adore the moſt glorious object in nature, whoſe influence is felt by all creation, and ſeen by every animated part of it, as the fountain of light, heat, and life. The power of healing diſeaſes being chiefly given by the ancients to medicinal plants and vegetable productions, it was natural to exalt into a divinity the viſible cauſe of their growth. Hence he was alſo ſtyled the *God of phyſic*; and that external heat which cheers and invigorates all nature, being transferred from the human body to the mind, gave riſe to the idea of all mental effervescence coming from this god; hence, likewiſe, poets, prophets, and muſicians, are ſaid to be *Numine afflati*, inſpired by Apollo.

(2.) APOLLO, CONJECTURES CONCERNING. Whether Apollo was ever a real perſonage, or only the great luminary, many have doubted. Indeed, Voſſius has taken great pains to prove this god to be only a metaphorical being, and that there never was any other Apollo than the ſun.—"He was ſtyled the *ſon of Jupiter* (ſays this author), becauſe that god was reckoned by the ancients the author of the world. His mother was called *Latona*, a name which ſignifies *hidden*; becauſe, before the ſun was created, all things were wrapped up in the obſcurity of chaos. He is always repreſented as beardleſs and youthful, becauſe the ſun never grows old or decays. And what elſe can his bow and arrows imply, but his piercing beams?" And he adds, "that all the ceremonies which were performed to his honour, had a manifeſt relation to the great ſource of light which he repreſented. Whence (he concludes) it is vain to ſeek for any other divinity than the ſun, which was adored under the name of Apollo." However, though this be in general true, yet it appears from many paſſages in ancient authors, that there was ſome illuſtrious perſonage named *Apollo*, who, after his apotheoſis, was taken for the ſun; as Oſiris and Orus in Egypt, whoſe exiſtence cannot be called in queſtion, were, after death, confounded with the ſun, of which they became the ſymbols, either from the glory and ſplendor of their reigns, or from a belief that their ſouls had taken up their reſidence in that luminary. Of the four Apollos mentioned by Cicero, it appears that the three laſt were Greeks, and the firſt an Egyptian; who, according to Herodotus, was the ſon of Oſiris and Iſis, and called *Orus*. Pauſanias is of the ſame opinion as Herodotus, and ranks Apollo among the Egyptian divinities. The teſtimony of Diodorus Siculus is ſtill more expreſs; for in ſpeaking of Iſis, after ſay-

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ing that ſhe had invented the practice of medicine, he adds, that ſhe taught this art to her ſon Orus, named *Apollo*, who was the laſt of the gods that reigned in Egypt. It is eaſy to trace almoſt all the Grecian fables and mythologies from Egypt. If the Apollo of the Greeks was ſaid to be the ſon of Jupiter, it was becauſe Orus the Apollo of the Egyptians had Oſiris for his father, whom the Greeks confounded with Jupiter. If the Greek Apollo was reckoned the God of eloquence, muſic, medicine, and poetry, the reaſon was, that Oſiris, who was the ſymbol of the ſon among the Egyptians, as well as his ſon Orus, had there taught thoſe liberal arts. If the Greek Apollo was the god and conductor of the muſes, it was becauſe Oſiris carried with him, in his expedition to the Indies, ſinging women and muſicians. This parallel might be carried on ſtill further; but enough has been ſaid to prove that the true Apollo was that of Egypt.

(3.) APOLLO, FABLES RESPECTING, EXPLAINED. To the other perfections of this divinity the poets have added beauty, grace, and the art of captivating the ear and the heart, no leſs by the ſweetneſs of his eloquence, than by the melodious ſounds of his lyre. However, with all theſe accompliſhments, he had not the talent of captivating the fair, with whoſe charms he was enamoured. But the amours and other adventures related of this god during his reſidence on earth, are too numerous, and too well known, to be inſerted here. His muſical conteſts, however, being more connected with the nature of this work, muſt not be wholly unnoticed. To begin, therefore, with the diſpute which he had with Pan, that was left to the arbitration of Midas. Pan, who thought he excelled in playing the flute, offered to prove that it was an inſtrument ſuperior to the lyre of Apollo. The challenge was accepted; and Midas, who was appointed the umpire in this conteſt, deciding in favour of Pan, was rewarded by Apollo, according to the poets, with the ears of an aſs, for his ſtupidity.—This fiction ſeems founded upon hiſtory. Midas, according to Pauſanias, was the ſon of Gordius and Cybele; and reigned in the Greater Phrygia, as we learn from Strabo. He was poſſeſſed of ſuch great riches, and ſuch an inordinate deſire of increaſing them by the moſt contemptible parſimony, that, according to the poets, he converted whatever he touched into gold. However, his talent for accumulation did not extend to the acquirement of taſte and knowledge in the fine arts; and, perhaps, his dulneſs and inattention to theſe provoked ſome muſical poets to invent the fable of his deciſion in favour of Pan againſt Apollo. The ſcholiaſt upon Ariſtophanes, to explain the fiction of his long ears, ſays, that it was deſigned to intimate that he kept ſpies in all parts of his dominions. Marſyas, another player on the flute, was ſtill more unfortunate than either Pan or his admirer Midas. This Marſyas, having engaged in a muſical diſpute with Apollo, choſe the people of Myſa for judges. Apollo played at firſt a ſimple air upon his inſtrument; but Marſyas, taking up his pipe, ſtruck the audience ſo much by the novelty of its tone, and the art of his performance, that he ſeemed to be heard with more pleaſure than his rival. Having agreed upon a ſecond trial of ſkill, the performance of Apollo, by accompanying the lyre with his voice, was allowed greatly to excel that of Marſyas upon the flute alone. Marſyas, with indignation, proteſted againſt the deciſion of his judges; urging that he had not been fairly vanquiſhed according to the rules ſtipulated, becauſe the diſpute was concerning the excellence of their ſeveral inſtruments, not their voices; and that it was wholly unjuſt to employ two arts againſt one. Apollo denied that he had taken any unfair advantages of his antagoniſt, ſince Marſyas had employed both his mouth and fingers in performing upon his inſtrument; ſo that, if he was denied the uſe of his mouth, he would be ſtill more diſqualified for the contention. The judges approved of Apollo's reaſoning, and ordered a third trial. Marſyas was again vanquiſhed; and Apollo, inflamed by the violence of the diſpute, flea'd him alive for his preſumption. See MARSYAS. Pauſanias ſays, that Apollo accepted the challenge from Marſyas, upon condition that the victor ſhould uſe the vanquiſhed as he pleaſed. Diodorus informs us, that Apollo, ſoon repenting of the cruelty with which he had treated Marſyas, broke the ſtrings of the lyre, and by that means put a ſtop for a time, to any farther progreſs in the practice of that new inſtrument. Poſſibly the fable of Marſyas might originate from ſome muſician of that name, who by too frequent and violent exertions, upon a pipe, or other wind inſtrument, might have hurt his conſtitution, eſpecially in a hot climate, and thus by a gradual decay, have reduced himſelf to mere ſkin and bone. The next important accident, mentioned in the hiſtory of Apollo, is his defeat of the ſerpent Python. The waters of Ducalion's deluge, ſays Ovid, which had overflowed the earth, left a ſlime, from whence ſprung innumerable monſters; and among others the ſerpent Python, which made great havoc in the country about Parnaſſus. Apollo, with his darts, put him to death; which, phyſically explained, implies, that the heat of the ſun having diſſipated the noxious ſtreams, thoſe monſters ſoon diſappeared: or, if this fable be referred to hiſtory, the ſerpent probably was a robber, who, haunting the country about Delphos, and very much infeſting thoſe who came thither to ſacrifice; a prince, who bore the name of Apollo, or one of the prieſts of that god, put him to death. This legend gave riſe to the inſtitution of the Pythian games, ſo frequently mentioned in the Grecian hiſtory; and it was from this, that the god himſelf was named *Pythius*, and his prieſteſs PYTHIA. The city of Delphos, where the famous oracles were ſo long delivered, was frequently ſtyled *Pythio*. As Apollo was the god of the fine arts, thoſe who cultivated them were called *bis ſons*. Of this number was Philammon of Delphos, whom the poets and mythologiſts make the twin brother of Autolychus, both ſons of the nymph Chione, but by different fathers. They tell us that both Apollo and Mercury, were favoured by the nymph on the ſame day, and that their fires were known from their different talents. Philammon, a great poet and muſician, was reported to be the offspring of the god who preſides over thoſe arts; and Autolychus, from the craftineſs,

craftineſs and ſubtility of his diſpoſition, was ſaid to have ſprung from Mercury, the god of theft and fraud. Philammon is one of the firſt, after Apollo, upon fabulous record, as a vocal performer; who accompanied himſelf with the ſound of the lyre: his ſon was the celebrated Thamyras. See THAMYRAS.

(4.) APOLLO, WORSHIP OF. Apollo was more generally revered in the Pagan world than any other deity; having, in almoſt every region of it, temples, oracles, and feſtivals, as innumerable as his attributes. The wolf and hawk were conſecrated to him, as ſymbols of his piercing eyes; the crow and the raven, becauſe theſe birds were ſuppoſed to have by inſtinct the faculty of prediction; the laurel, from a perſuaſion that thoſe who ſlept with ſome branches of that tree under their heads received certain vapours, which enabled them to propheſy. The cock was conſecrated to him, becauſe by his crowing he announces the riſing of the ſun; and the graſshopper on account of his ſinging faculty, which was ſuppoſed to do honour to the god of muſic. Plato ſays that the graſshopper ſings all ſummer without food, like thoſe men who, dedicating themſelves to the Muſes, forget the common concerns of life. The ſwan was regarded by the ancients as a bird ſacred to Apollo in two capacities; firſt, as being, like the crow and raven, gifted with the ſpirit of prediction; and, 2dly, for his extraordinary vocal powers. The ſweetneſs of his ſong, eſpecially at the approach of death, was not only extolled by all the poets of antiquity, but by hiſtorians, philoſophers, and ſages; and to call a great writer the *ſwan* of his age and nation, was a full acknowledgement of his ſuperiority. See ANAS, N° 15 § 1. Thus Horace calls Pindar *the Theban ſwan*. Plutarch, who was himſelf a prieſt of Apollo, in his dialogue upon muſic, makes one of his interlocutors ſay, that an invention ſo uſeful and charming could never have been the work of man, but muſt have originated from ſome god, ſuch as Apollo the inventor of the flute and lyre, improperly attributed to Hyagnis, Marſyas, Olympus, and others; and the proofs he urges in ſupport of this aſſertion, ſhow, if not its truth, at leaſt that it was the common opinion. "All dances and ſacrifices, ſays he, uſed in honour of Apollo, are performed to the ſound of flutes: the ſtatue of this god at Delos, erected in the time of Hercules, had in its right hand a bow; and on the left ſtood the three Graces, who were furniſhed with three kinds of inſtruments; the lyre, the flute, and the ſyrinx. The youth alſo, who carries the laurel of Tempe to Delphos, is accompanied by one playing on the flute; and the ſacred preſents formerly ſent to Delos by the Hyperboreans, were conducted thither to the ſound of lyres, flutes, and ſhepherds pipes." Callimachus wrote a hymn, in honour of Apollo, which was for many ages performed among the Greeks, at their religious feſtivals, with the moſt enthuſiaſtic zeal. For a tranſlation of it, See Prior's poems.

(II.) APOLLO BELVIDERE, one in the firſt claſs of the ancient ſtatues. The excellence of this ſtatue conſiſts in the expreſſion of ſomething divine, whereas the reſt excel only in things that are common to men. This ſtatue may perhaps juſtly claim the preference, even in the ſuperior and diſtinguiſhed claſs of the beſt remains of all antiquity. There are about 20 ancient ſtatues which the moderns have diſcovered that are referred to the firſt claſs, and conſidered each as the chief beauty in its kind.

(1.) APOLLODORUS, a celebrated grammarian of Athens, the ſon of Aſclepiades and diſciple of Ariſtarchus. He wrote many works not now extant; but his moſt famous production was his Bibliotheca, concerning the origin of the gods. The work conſiſted of 24 books, but only three are now extant. Several other pieces of his age are to be found in Fabricius's *Bibliotheca Græca*.

(2.) APOLLODORUS, a famous painter of Athens, who about A. A. C. 408, invented the art of mingling colours, and of expreſſing lights and ſhades. He was admired alſo for his judicious choice of ſubjects, and for the beauty and ſtrength of colouring ſurpaſſed all the maſters that went before him. He excelled likewiſe in ſtatuary.

(3.) APOLLODORUS, a native of Damaſcus, an eminent architect under Trajan and Hadrian. He had the direction of the bridge of ſtone which Trajan ordered to be built over the Danube, A. D. 104, which was eſteemed the moſt magnificent of all the works of that emperor. Adrian, one day, as Trajan was diſcourſing with this architect upon the buildings he had raiſed at Rome, gave his judgment, and ſhowed he underſtood nothing of the matter. Apollodorus turned upon him bluntly, and ſaid to him, Go paint citruls, for you are very ignorant of the ſubject we are talking upon. Adrian at this time boaſted of his painting citruls well. This inſult coſt Apollodorus his life, afterwards.

(1.) APOLLONIA, feaſts ſacred to Apollo, inſtituted upon the following occaſion. Apollo, having vanquiſhed Python, went with his ſiſter Diana to Ægialea; but, being driven from thence, he removed to the iſland Crete. The Ægialeans were ſoon after viſited with a plague; upon which, conſulting the ſoothſayers, they were ordered to ſend 7 young men and as many virgins, to appeaſe theſe deities and bring them back into their country. Apollo and Diana being thus appeaſed, returned to Ægialea: in memory of which, they dedicated a temple to Pitho, the *goddeſs of perſuaſion*; whence a cuſtom aroſe of chooſing every year ſeven young men, and as many virgins, to go as it were in ſearch of Apollo and Diana.

(2.) APOLLONIA, in geography, a promontory of Africa, upon the coaſt of Guinea, near the mouth of the river Mancu.

(3.) APOLLONIA, the name of a colony of the Mileſians in Thrace, from which Lucullus took away a coloſſus of Apollo, and placed it in the capitol. The greateſt part of the town was ſituated in a ſmall iſland on the Euxine, in which was a temple of Apollo. Pliny ſays the coloſſus was 30 cubits high, and coſt 500 talents.

(4—9.) APOLLONIA, the name of ſeveral other ancient towns, viz. 4. in Albania: 5. in Aſia Minor, on the coaſt, ſuppoſed to be the Aſſos mentioned in the Acts of the Apoſtles: 6. in Barca, with a capacious harbour, called by the Arabs, Bonandrea and, 7. in Macedonia, 8. at mount Pa-

naſſus, near Delphi, and, 9. Troezen was formerly called *Apollonia*.

APOLLONIAN HYPERBOLA, and *parabola*. See HYPERBOLA, &c.

(1.) APOLLONIUS, author of the *Argonautics*, ſurnamed THE RHODIAN, from the place of his reſidence, is ſuppoſed to have been a native of Alexandria, where he is ſaid to have recited ſome portion of his poem while he was yet a youth. Finding it ill received by his countrymen, he retired to Rhodes; where he is conjectured to have poliſhed and completed his work, ſupporting himſelf by the profeſſion of rhetoric, and receiving from the Rhodians the freedom of their city. He at length returned, with conſiderable honour to the place of his birth; and ſucceeded Eratoſthenes in the care of the Alexandrian library, in the reign of Ptolemy Euergetes, about A. A. C. 246. That prince had been educated by the famous Ariſtarchus, and rivalled the preceding ſovereigns of his liberal family in the munificent encouragement of learning. Apollonius was a diſciple of the poet Callimachus; but their connection ended in the moſt violent enmity, which was probably owing to ſome degree of contempt expreſſed by Apollonius for the light compoſitions of his maſter. The only work of Apollonius which has deſcended to modern times is his poem above mentioned, in four books, on the Argonatic expedition. Both Longinus and Quintilian have aſſigned to this work the mortifying character of mediocrity: "But (ſays Mr Hayley) there lies an appeal from the ſentence of the moſt candid and enlightened critics to the voice of Nature; and the merit of Apollonius has little to apprehend from the deciſion of this ultimate judge. His poems abound in animated deſcription, and in paſſages of the moſt tender and pathetic beauty. How finely painted is the firſt ſetting forth of the Argo! and how beautifully is the wife of Chiron introduced, holding up the little Achilles in her arms, and ſhowing him to his father Peleus as he ſailed along the ſhore! But the chief excellence in our poet, is the ſpirit and delicacy with which he has deſcribed the paſſion of love in his Medea. That Virgil thought very highly of his merit in this particular, is ſufficiently evident from the minute exactneſs with which he has copied many tender touches of the Grecian poet. Thoſe who compare the 3d book of Apollonius with the 4th of Virgil, may, I think, perceive not only that Dido has ſome features of Medea, but the two bards, however different in their reputation, reſembled each other in their genius; and they both excel in delicacy and pathos."—The ancient ſcholia upon his *Argonautics*, ſtill extant, are extremely uſeful, and full of learning. The beſt editions of his poems are thoſe of Oxford, 2 vols 4to, 1777, and of Brunk, in 8vo. Henry Stephens publiſhed an edition in 1574, 4to; it has been tranſlated into Engliſh verſe by Dr Ekins, late dean of Carliſle.

(2.) APOLLONIUS of Perga, in Pamphylia, was a great geometrician, under Ptolemy Euergetes, from the 133d Olympiad to the 139th. He ſtudied at Alexandria, under the diſciples of Euclid; and compoſed ſeveral works, of which that only of the Conics remains, which was firſt publiſhed by Commandinus, at Bologna, in 1566. Dr Halley gave a noble edition in 1710, at Oxford, in folio.

(3.) APOLLONIUS, of Tyana in Cappadocia, a Pythagorean philoſopher, who flouriſhed about the beginning of the firſt century. At 16 years of age he became a ſtrict obſerver of Pythagoras' rules, renouncing wine, women, and all ſorts of fleſh; not wearing ſhoes, letting his hair grow, and wearing nothing but linen. He ſoon after ſet up for a reformer of mankind, and choſe his habitation in a temple of Æſculapius, where he is ſaid to have performed many wonderful cures. Philoſtratus has wrote the life of Apollonius, in which there are numberleſs fabulous ſtories recounted of him. We are told that he went five years without ſpeaking; and yet, during this time, that he ſtopped many ſeditions in Cilicia and Pamphylia: that he travelled and ſet up for a legiſlator; and that he gave out that he underſtood all languages, without having ever learned them: that he could tell the thoughts of men, and underſtood the oracles which birds gave by their ſinging. The Heathens were fond of oppoſing the pretended miracles of this man to thoſe of our Saviour; and by a treatiſe which Euſebius wrote againſt one Hierocles, we find that the dritt of the latter, in the treatiſe which Euſebius refutes, ſeems to have been to draw a parallel betwixt Jeſus Chriſt and Apollonius, in which he gives the preference to this philoſopher. Mr Du Pin has wrote a confutation of Philoſtratus's life of Apollonius. Apollonius wrote ſome works; viz. four books of judicial aſtrology; a treatiſe upon the ſacrifices, ſhowing what was proper to be offered to each deity; and a great number of letters; all of which are now loſt.

(4.) APOLLONIUS, Dyſcolus, or the Lean, a grammarian of Alexandria, in the ſecond century. He wrote in Greek, a book "On Syntax," which was printed firſt at Venice, in 1495, and afterwards at Franckfort, in 1590. There is likewiſe aſcribed to him a collection of hiſtorical curioſities, printed at Baſil, in 1568, and at Leyden in 1620.

(5.) APOLLONIUS, a chriſtian martyr of the 2d century. He was a member of the Roman ſenate, and a man of great eloquence and learning.

(6.) APOLLONIUS, a learned grammarian in the time of Auguſtus. He compiled a Greek Lexicon to Homer, which was printed at Paris in 1773, 2 vols 4to.

(7.) APOLLONIUS, a ſtoic philoſopher of Chalcis, who, coming to Rome, was ſent for by the emperor Antoninus Pius, to be preceptor to Marcus Aurelius, on which the philoſopher rudely ſaid, that it was the place of the ſcholar to wait on the maſter, and not the maſter on the ſcholar. The emperor mildly obſerved, that he was ſurpriſed Apollonius ſhould find it farther from his lodgings to the palace than from Chalcis to Rome.

(8.) APOLLONIUS COLLATIUS, Peter, a prieſt of Navarre, in the 15th century. He wrote a poem on the ſiege of Jeruſalem, which, with other poems, was publiſhed at Milan in 1692, 8vo.

APOLLOS, in Scripture hiſtory, a Jew of Alexandria, who came to Epheſus, during the abſence of St Paul, who was gone to Jeruſalem (Acts xviii. 24. Apollos was an eloquent man, well verſed in the Scriptures; and ſpoke with zeal and

fervour; but knowing nothing but the baptiſm of John, he was only a catechumen, or one of the loweſt order of Chriſtians, and did not as yet diſtinctly know the myſteries of the Chriſtian doctrine. However, he knew that Jeſus Chriſt was the Meſſiah, and declared himſelf openly to be his diſciple. When therefore he was come to Epheſus, he began to ſpeak boldly in the ſynagogue, and to ſhow that Jeſus was the Chriſt. Aquila and Priſcilla having heard him, took him home with them; and inſtructed him more fully in the ways of God. Some time after this he had a mind to go into Achaia; and the brethren wrote to the diſciples, deſiring them to receive him. He arrived at Corinth; and was there very uſeful in convincing the Jews out of the Scriptures, that Jeſus was the Meſſiah. Thus he watered what St Paul had planted in this city; but the great fondneſs which his diſciples had for his perſon had almoſt produced a ſchiſm; ſome "ſaying, I am of Paul; others, I am of Apollos, I am of Cephas," &c. However, this diviſion, which St Paul ſpeaks of in the chapter laſt quoted, did not prevent that apoſtle and Apollos from being cloſely united by the bands of charity. Apollos hearing that the apoſtle was at Epheſus, went to meet him, and was there when St Paul wrote the epiſtle to the Corinthians; wherein he teſtifies, that he had earneſtly entreated Apollos to return to Corinth, but hitherto had not been able to prevail with him; that, nevertheleſs, he gave him room to hope that he would go when he had an opportunity. St Jerom ſays, that Apollos was ſo diſſatisfied with the diviſion which had happened upon his account at Corinth, that he retired into Crete with Zena, a doctor of the law; and that this having been appeaſed by the letter which St Paul wrote to the Corinthians, Apollos returned to this city, and was biſhop thereof. The Greeks made him biſhop of Duras; others ſay, he was biſhop of Iconium in Phrygia; and others, that he was biſhop of Cæſarea.

APOLLYON, a Greek word that ſignifies *the deſtroyer*, and anſwers to the Hebrew *Abaddon*. St John in the Revelations (ix. 11.) ſays, that an angel having opened the bottomleſs pit, a thick ſmoke iſſued out of it; and with this ſmoke locuſts, like horſes, prepared for battle, and commanded by the angel of the bottomleſs pit, called in Hebrew *Abaddon*, but in the Greek *Apollyon*.

APOLOGER. See APOLOGIST.

APOLOGETIC, in literary hiſtory, the title of a work of Tertullian, of great ſtrength and ſpirit. He there vindicates the Chriſtians from all that had been objected to them; particulary from the abominable crimes ſaid to have been perpetrated at their meetings, and their want of love and fidelity to their country. The ground of this laſt accuſation was, their refuſing to take the accuſtomed oaths, and ſwear by the tutelary gods of the empire.—Tertullian addreſſes his Apologetic to the magiſtrates of Rome, the emperor Severus being then abſent.

* APOLOGETICALLY. *adv.* [from *apologetical*.] In the way of defence or excuſe.

* APOLOGETICAL. *adj.* [from ἀπολογία, to defend.] That which is ſaid in defence of any thing or perſon.—I deſign to publiſh an eſſay, the greater part of which is *apologetical*, for one ſort of chemiſts. *Boyle*.

APOLOGIES FOR CHRISTIANITY. Although Chriſtianity is in itſelf ſo excellent, as, properly ſpeaking, to require no apology, yet the infidelity and wickedneſs of mankind have rendered apologies for it neceſſary in all ages, ſince its firſt appearance, and in none perhaps more than in the preſent. The principal ancient apologies in favour of the Chriſtians are thoſe of Quadratus, written about the year 124, and addreſſed to the emperor Adrian; of Ariſtides, written ſoon after the former; two of Juſtine Martyr, one of which was written in the year 150, and addreſſed to Antonine, and the other in 166, addreſſed to the Roman ſenate; one of Athenagoras in 166, to the emperors M. Aurelius, and Lucius Verus; the apologetic of Tertullian; and the dialogue of Minutius Felix, called *Octavius*, written in the third century. It would be endleſs to enumerate the various works which have been publiſhed in modern times, that might be claſſed under this title; but one of the laſt and beſt that expreſsly bears it, is the Biſhop of Landaff's APOLOGY *for the* BIBLE, *in a ſeries of Letters addreſſed to* THOMAS PAINE. This work is juſtly entitled to be called an *apology*, not only in the common ſenſe, (See APOLOGY, N° 1.) but alſo in the ancient ſenſe of the word; which originally ſignifies *refutation*, being derived from the Greek verb, ἀπολογέομαι, which ſignifies to refute. In this ſenſe, we would recommend the learned Biſhop's Apology for the Bible, as a moſt complete and ſatisfactory refutation of Mr Paine's *Age of Reaſon*, and as proper to be peruſed by all, who wiſh to diſtinguiſh truth from falſehood, and to have their minds properly fortified againſt the impreſſions that are too apt to be made by the ſophiſtry of modern infidels.

* APOLOGIST. *n. ſ.* [from *To apologize*.] He that makes an apology; a pleader in favour of another.

* *To* APOLOGIZE. *v. n.* [from *apology*.] 1. To plead in favour of any perſon or thing.—It will be much more ſeaſonable to reform than *apologize* or rhetoricate; and therefore it imports thoſe who dwell ſecure, to look about them. *Decay of Piety*. 2. It has the particle *for* before the ſubject of apology.—It ought to *apologize for* my indiſcretion in the whole undertaking. *Wake's Preparation for Death*.

(1.) * APOLOGUE. *n. ſ.* [ἀπόλογος.] Fable; ſtory contrived to teach ſome moral truth.—An *apologue* of Æſop is beyond a ſyllogiſm, and proverbs more powerful than demonſtration. *Brown's Vulgar Errours*.

(2.) APOLOGUE, AND PARABLE, DIFFERENCE BETWEEN. The only difference between a parable and apologue is, that the former, being drawn from what paſſes among mankind, requires probability in the narration; whereas the apologue, being taken from the ſuppoſed actions of brutes, or even of things inanimate, is not tied down to the ſtrict rules of probability. Æſop's fables are a model of this kind of writing.

(1.) * APOLOGY. *n. ſ.* [*apologia*, Lat ἀπολογία. 1. Defence; excuſe. *Apology* generally ſignifies rather excuſe than vindication, and tends rather to

to extenuate the fault, than prove innocence. This is however, ſometimes unregarded by writers.—

In her face, excuſe
Came prologue; and *apology* too prompt;
Which with bland words at will ſhe thus addreſs'd. *Milton.*

2. It has *for* before the object of excuſe.—It is not my intention to make an *apology for* my poem: ſome will think it needs no excuſe, and others will receive none. *Dryden.*—I ſhall neither trouble the reader, nor myſelf, with any *apology for* publiſhing of theſe ſermons; for if they be, in any meaſure, truly ſerviceable to the end for which they are deſigned, I do not ſee what *apology* is neceſſary; and if they be not ſo, I am ſure none can be ſufficient. *Tillotſon.*

(2.) APOLOGY, in literary hiſtory. See APOLOGETIC, and APOLOGIES.

APOLUSIS, } [from απολυω, I releaſe,] in a geAPOLYSIS, } neral ſenſe, the ſolution, or reſolution of any thing. Thus we read of the apolyſis of a diſeaſe, the apolyſis of a bandage, or the like. Apolyſis, in a more particular ſenſe, denotes the excluſion of any thing. Thus we read of the apolyſis of the *fœtus*, the fecundines, and the like.

* APOMECOMETRY. *n. ſ.* [απο, from, μηκος, diſtance, and μετρεω, to meaſure.] The art of meaſuring things at a diſtance. *Dict.*

APOMELI, among ancient phyſicians, a decoction of honey and vinegar, much uſed as a detergent promoter of ſtool, urine, &c. among the Greeks.

APONYOS DEUS, [from απο, and μυια, fly,] in the heathen mythology, a name under which Jupiter was worſhipped at Elis, and Hercules as well as Jupiter at the Olympic games. Theſe deities were ſupplicated under this name, to deſtroy or drive away the vaſt number of flies which always attended at the great ſacrifices; and in thoſe which accompanied the Olympic games, the firſt was always to the *Apomyos*, or *Myiagrus Deus*, that he might drive away the flies from the reſt. The uſual ſacrifice was a bull.

(1.) * APONEUROSIS. *n. ſ.* [from απο, from, and νευρον, a nerve.] An expanſion of a nerve into a membrane.—When a cyſt riſes near the orifice of the artery, it is formed by the *aponeuroſis* that runs over the veſſel, which becomes exceſſively expanded. *Sharp's Surgery.*

(2.) APONEUROSIS, is alſo uſed for the cutting off a nerve; and ſometimes for the tendon itſelf.

APONEUROTICUS MUSCULUS, in anatomy, a name given by Spigelius, and ſome others, to a muſcle of the thigh, called by Cowper and Winſlow the *muſculus lati tendinis*, and *muſculus faſciæ latæ*. Winſlow has called it, with more propriety, the *tenſor vaginæ femoris*. See ANATOMY, § 216.

APONIA, [from α, and πονος, labour,] among phyſicians, a ſtate of indolence, or the abſence of pain. In which ſenſe, the word amounts to the ſame with anodynes. Hence alſo aponia is uſed by ſome for medicines which do not excite pain.

APONO, Peter d', one of the moſt famous philoſophers and phyſicians of his age, born in 1250, in a village about 4 miles from Padua. He ſtudied ſome time at Paris, and was there promoted to the degree of doctor in philoſophy and phyſic. When he came to practiſe as a phyſician, he is ſaid to have inſiſted on very large ſums for his viſits: we are not told what he demanded for the viſits he made in the place of his reſidence; but it is affirmed, that he would not attend the ſick in any other place under 150 florins a-day; and when he was ſent for by Pope Honorius IV. he demanded 400 ducats for each day's attendance. He was ſuſpected of magic, and proſecuted by the Inquiſition on that account. "The common opinion of almoſt all authors (ſays Naude) is, that he was the greateſt magician of his age; that he had acquired the knowledge of the ſeven liberal arts, by means of the ſeven familiar ſpirits, which he kept incloſed in a cryſtal; and that he had the dexterity to make the money he had ſpent come back into his purſe!" The ſame author adds, that he died before the proceſs againſt him was finiſhed, being then in the 80th year of his age; and that, after his death, they ordered him to be burnt in effigy, in the public place of the city of Padua; deſigning thereby to ſtrike a fear into others of incurring the like puniſhment; and to ſuppreſs the reading three books which he had wrote; the firſt being the Heptameron, which is printed at the end of the firſt volume of Agrippa's work; the ſecond, that which is called by Trithemius, *Elucidarium necromanticum Petri de Albano*; and the laſt, that which is entitled by the ſame author, *Liber experimentorum mirabilium de annullis ſecundum xxviii. manſiones lunæ.* His body being ſecretly taken up by his friends, eſcaped the vigilance of the inquiſitors, who would have burnt it. It was removed ſeveral times, and was at laſt placed in the church of St Auguſtin, without an epitaph or any mark of honour. The moſt remarkable book which Apona wrote, was that which procured him the ſirname of *Conciliator*; he wrote alſo a piece intitled *De medicina omnimoda*. There is a ſtory told of him, that having no well in his houſe, he cauſed his neighbour's to be carried into the ſtreet by devils when he heard they had forbidden his maid fetching water there. He had much better (ſays Mr Bayle) have employed the devils to make a well in his own houſe, and have ſtopped up his neighbours; or, at leaſt, tranſported it into his houſe, rather than into the ſtreet.

APONOGETON: A genus of the digynia order, belonging to the heptandria claſs of plants, which has no Engliſh name. The calyx is an oblong omentum; there is no corrolla; and the capſulæ are three-ſeeded. There are two ſpecies, natives of the Indies.

APONUS, a hamlet near Patavium, with warm baths. It was the birth-place of Livy, and is now called *Albano*. Lon. 10. 0. E. Lat. 45. 17.

APOPEMPTIC, [from αποπεμπω, to diſmiſs,] in the ancient poetry, a hymn addreſſed to a ſtranger on his departure from a place to his own country. The ancients had certain holidays, wherein they took leave of the gods with *apopemptic* ſongs, as ſuppoſing them returning each to his own country. The deities having the patronage of divers places, it was but juſt to divide their preſence, and allow ſome time to each. Hence it was, that among the Delians and Mileſians we find feaſts of Apollo, and among the Argians feaſts of Diana, called *Epidemiæ*, as ſuppoſing theſe deities then more peculiarly reſident among

them. On the laſt day of the feaſt they diſmiſſed them, following them to the altars with *apopemptic* hymns!

(1.) * APOPHASIS. *n. ſ.* [Lat. αποφασις, a denying.] A figure in rhetorick, by which the orator, ſpeaking ironically, ſeems to wave what he would plainly inſinuate; as, *Neither will I mention, thoſe things, which If I ſhould, you notwithſtanding could neither confute or ſpeak againſt them. Smith's Rhetorick.*

(2.) APOPHASIS, in civil law, an anſwer or reſcript of the prince. The word was alſo uſed for the account given of eſtates, at the exchange of them for the avoiding public employments. When any man would excuſe himſelf from any troubleſome and chargeable truſt, by caſting it on another richer than himſelf, the perſon produced had power to challenge him to make an exchange of eſtates, and thereby compel him to undergo the office he had before refuſed.

* APOPHLEGMATICK. *n. ſ.* [απο and φλεγμα.] That which has the quality of drawing away phelgm.

* APOPHLEGMATISM. *n. ſ.* [απο and φλεγμα.] A medicine of which the intention is to draw phlegm from the blood.—And ſo it is in *apophlegmatiſms* and gargariſms, that draw the rheum down by the palate. *Bacon.*

(1.) * APOPHLEGMATIZANT. *n. ſ.* [απο and φλεγμα.] Any remedy which cauſes an evacuation of ſerous or mucous humour by the noſtrils as particular kinds of ſtrenutatories. *Quincy.*

(2.) APOPHLEGMATIZANTS are of two kinds, one adminiſtered by the mouth, and intended to operate by ſpitting; the other given by the noſtrils, to operate by ſneezing, &c.

APOPHORETA, [from αποφερω, I carry away,] in antiquity, preſents made to the gueſts at a feaſt, or other entertainments, which they carry away with them.

APOPHRADES, [from αποφρας, unfortunate,] in phyſic, or rather in ſuperſtition, unhappy days, wherein either no criſis, or an ill one is to be expected.

(1.) * APOPHTHEGM. *n. ſ.* [αποφθεγμα.] A remarkable ſaying; a valuable maxim uttered on ſome ſudden occaſion.—We may magnify the *apophthegms*, or reputed replies of wiſdom, whereof many are to be ſeen in Laertius and Lycoſthenes. *Brown's Vulgar Errours.*

(2.) APOPHTHEGMS pronounced by eminent characters are numerous in ancient authors. Such is that of Cyrus: "He is *unworthy* to be a magiſtrate, who is not *better* than his ſubjects." Or this: "He that will not take care of *his own* buſineſs, will be forced to take care of that *of others*:" That of Artaxerxes Mnemon, when reduced to hunger by the loſs of his baggage: "How much *pleaſure* have I hitherto lived a ſtranger to?" And that of Cato, *Homines* nihil *agendo diſcunt* male *agere*; "Men, by doing *nothing*, learn to do *miſchief*;" &c. The apophthegms of Plutarch are well known.

APOPHTHORA, the bringing forth a child putrefied.

* APOPHYGE. *n. ſ.* [αποφυγη, flight, or eſcape.] Is, in architecture, that part of a column, where it begins to ſpring out of its baſe; and was originally no more than the ring or ferrel, which anciently bound the extremities of wooden pillars, to keep them from ſplitting, and were afterwards imitated in ſtone work. We ſometimes call it the ſpring of the column. *Chambers.*

(1.) * APOPHYSIS. *n. ſ.* [αποφυσις,] The prominent parts of ſome bones; the ſame as proceſs.—It differs from an epiphyſis, as it is a continuance of the bone itſelf; whereas the latter is ſomewhat adhering to a bone, and of which it is not properly a part. *Quincy.*—It is the *apophyſis*, or head of the os tibiæ, which makes the knee. *Wiſeman.*

(2.) APOPHYSIS, in anatomy. See ANATOMY, INDEX.

(3.) APOPHYSIS, in botany, an excreſcence from the receptacle of the muſci.

APOPLANESIS, [from αποπλανεω, I deceive,] in oratory, a kind of fallacious defence, and ſlurring over, darkening, and concealing things, in order to blind the judges, or the audience. It alſo implies that ſpecies of confutation, wherein the ſpeaker promiſes to anſwer what the adverſary objects in another place, but which being too difficult to anſwer, is afterwards left to paſs unanſwered.

APOPLECTICA, apoplectical medicines, a name uſed by ſome for what are more properly called ANTAPOPLECTICS.

* APOPLECTICAL. *adj.* [from *apoplexy.*] Relating to an apoplexy.—We meet with the ſame complaints of gravity in living bodies, when the faculty locomotive ſeems aboliſhed; as may be obſerved in ſupporting perſons inebriated, *apoplectical*, or in lipothymies and ſwoonings. *Brown.*

APOPLECTICAL BALSAMS, a ſort of ſweet-ſcented balms, prepared of diſtilled oils and uſed by way of perfume.

* APOPLECTICK. *adj.* [from *apoplexy.*] Relating to an apoplexy.—A lady was ſeized with an *apoplectic* fit, which afterward terminated in ſome kind of lethargy. *Wiſeman.*

APOPLECTIC VEINS, a name ſometimes given to the *jugulars*. Theſe are ſometimes alſo denominated among ancient writers, *ſoporales.*

* APOPLEX. *n. ſ.* [See APOPLEXY.] Apoplexy. The laſt ſyllable is cut away; but this is only in poetry.—

Preſent puniſhment purſues his maw,
When ſurfeited and ſwell'd, the peacock raw,
He bears into the bath; whence want of breath,
Repletions, *apoplex*, inteſtate death. *Dryden.*

* APOPLEXED. *adj.* [from *apoplex.*] Seized with an apoplexy.—

Senſe, ſure, you have,
Elſe could you not have motion: but ſure that ſenſe
Is *apoplexed*. *Shakeſpeare.*

(1.) * APOPLEXY. *n. ſ.* [αποπλαξις.] A ſudden deprivation of all internal and external ſenſation, and of all motion, unleſs of the heart and thorax. The cauſe is generally a repletion, and indicates evacuation, joined with ſtimuli. *Quincy.*—*Apoplexy* is a ſudden abolition of all the ſenſes, external and internal, of all voluntary motion, by the ſtoppage of the flux and reflux of the animal ſpirits through the nerves deſtined for thoſe motions. *Arbuthnot.*

(2.) APOPLEXY. See MEDICINE, INDEX.

APOPLISTÆ, [from απο, and οπλον, arms,] in ancient

ancient laws, a ſort of officers in the country appointed to diſarm all private perſons, or thoſe not entitled to have arms; for the prevention of miſchief and violence.

APOPOMPÆ, in antiquity, certain days in which ſacrifices were offered to the gods called Pompæi. Who theſe deities were is doubtful.

APOPSYCHIA, [from αποψυχω, I expire,] is underſtood of effluvia, emitted from the ſun, moon, and other heavenly bodies; to which their influence on ſublunary things was aſcribed by aſtrologers.

APORE, [απορος, Gr.] doubting. See APORIME.

* APORIA. *n. ſ.* [απορια.] Is a figure in rhetoric, by which the ſpeaker ſhews, that he doubts where to begin for the multitude of matter, or what to ſay in ſome ſtrange and ambiguous thing; and doth as it were, argue the caſe with himſelf. Thus Cicero ſays,—*Whether he took them from his fellows more impudently, gave them to a harlot more laſciviouſly, removed them from the Roman people more wickedly, or altered them more preſumptuouſly, I cannot well declare. Smith's Rhetorick.*

APORIME, } [from απορος, difficult, impracti-
APORON, } cable, a problem difficult to reſolve, and which has never been reſolved, though it be not in itſelf, impoſſible; Such as the quadrature of the circle; the duplicature of the cube; the triſection of an angle, &c. When a queſtion was propoſed to any of the Greek philoſophers, eſpecially of the ſect of Academiſts; if he could not give a ſolution, his anſwer was, Απορια, *I cannot ſee through it.*—This word is alſo uſed by ſome law writers for an inexplicable ſpeech or diſcourſe.

APORRHEAS. See APORRHOES.

(1.) * APORRHOEA. *n. ſ.* [απορροια.] Effluvium; emanation; ſomething emitted by another: not in uſe.—The reaſon of this he endeavours to make out by atomical *aporrhœus*, which paſſing from the cruentate weapon to the wound, and being incorporated with the particles of the ſalve, carry them to the affected part. *Glanville's Sceptis.*

(2.) APORRHOEA, in aſtrology, is when the moon ſeparates from one planet and applies to another.

(3.) APORRHOEA, in phyſic, is uſed for morbid or contagious *miaſmata*, or effluvia from unwholeſome bodies. The word is alſo uſed to denote a ſhedding or falling off of the hair. See ALOPECIA.

APORRHOES, [from απορεω, to flow from,] in philoſophy, ſulphureous effluvia, or exhalations, emitted from the earth, and ſubterraneous bodies.

APOS, in ornithology, the ſea ſwallow.

APOSCEPARNISMUS, [from απο, and σκιπαρνον, a hatchet,] a ſpecies of fracture of the ſkull or other bone, wherein a piece is taken clearly off, as if cut out with a hatchet.

(1.) * APOSIOPESIS. *n. ſ.* [αποσιωπησις, from απο, from, and σιωπαω, to be ſilent.] A form of ſpeech, by which the ſpeaker, through ſome affection, as ſorrow, baſhfulneſs, fear, anger, or vehemency, breaks off his ſpeech before it be all ended. A figure, when, ſpeaking of a thing, we yet ſeem to conceal it, though indeed we aggravate it; or when the courſe of the ſentence begun is ſo ſtayed, as thereby ſome part of the ſentence not being uttered, may be underſtood. *Smith's Rhetorick.*

(2.) APOSIOPESIS, called alſo RETICENCY, and SUPPRESSION, is commonly uſed to denote the ſame with ELLIPSIS. Jul. Scaliger diſtinguiſhes them. The latter, according to him, being only the ſuppreſſion of a word; the former, the omitting to relate ſome part of the action. This figure is of uſe to keep up the ſublimity of a diſcourſe.

APOSITION, [from απο, and σιτος, food,] in medicine, an averſion to food. It amounts to much the ſame with ANOREXIA; though ſome make a difference; alledging that the latter imports an inappetency, or want of deſire to eat; the former an averſion or loathing of it.

APOSPASMA, [from αποσπαω, I tear off,] in medicine, denote a ſolution of continuity in ſome organical part, as a membrane, ligament, or the like. The word is alſo applied to metalline recrements, as *tutia melanteria*, miſy, ſory, or the like.

APOSPHACELIS, or } [from αποσφακιλος, mor-
APOSPHACELISIS, } tification, &c. in the ancient phyſic, denotes a mortification of a fleſhy part, happening in caſes of wounds, and fractures, from too light a ligature.

APOSPARAGISMA, [from απο and σφραγιζω, to ſeal,] in antiquity, the figure or impreſſion of a ſeal. It was forbid among the ancients to have the figure or image of God on their rings and ſeals. To this purpoſe the precept of Pythagoras, Εν δακτυλιω εικονα θεου μη περιφερειν! But in proceſs of time, this was little regarded; it was uſual to have the figures of Egyptian and other deities, as well as of heroes, monſters, friends, anceſtors, and even brutes, on their *dactyli*, or ring ſeals. Thus Cæſar had the image of Venus, Pollio of Alexander, Auguſtus of the *ſphinx*, Pompey of a frog, Lentulus of his grandfather, &c.

APOSPONGISMUS, among ancient phyſicians, the application of a ſponge, whether dry or ſoaked with water, either to cleanſe a part, or to eaſe pains, allay itching, or refreſh the ſpirits.

APOSTA, a creature in America, ſo great a lover of men, that it follows them and delights to gaze on them! Mr *Bailey*, who gives the above brief account of this animal, has not told us, whether it is a quadruped, a bird, or a reptile.

APOSTACY. See APOSTASY, § 1, 2. and 3.

APOSTAGMA, [from αποσταζω, I diſtil,] in natural hiſtory, the juice which runs from the grapes before they are trodden or preſſed. It is alſo called *apoſtalagma*.

APOSTARE LEGES, in law, wilfully to tranſgreſs the law.

APOSTASIS, [from αφιστημι, I depart, &c.] in phyſic, the ſame with abſceſs. The word alſo denotes a removal of the morbid matter, in the criſis of a diſeaſe. It is likewiſe uſed by Hippocrates for a fracture of a bone, wherein ſome part is entirely broken off.

(1.) * APOSTASY. *n. ſ.* [αποστασις.] Departure from what a man has profeſſed: it is generally applied to religion; ſometimes with the particle *from*.—The canon law defines *apoſtaſy* to be a wilful departure from their ſtate of faith, which

any

any perſon has profeſſed himſelf to hold in the Chriſtian church. *Ayliffe's Parergon.*

(2.) APOSTASY, ANCIENT DISTINCTIONS OF. The primitive Chriſtian church diſtinguiſhed ſeveral kinds of apoſtaſy. The firſt, of thoſe who went entirely from Chriſtianity to Judaiſm; the ſecond, of thoſe who mingled Judaiſm and Chriſtianity together; and the third, of thoſe who complied ſo far with the Jews, as to communicate with them, in many of their unlawful practices, without making a formal profeſſion of their religion. But the fourth ſort was of thoſe, who, after having been ſome time Chriſtians, voluntarily relapſed into Paganiſm.

(3.) APOSTASY, LAWS AGAINST. The perverſion of a Chriſtian to Judaiſm, Paganiſm, or other falſe religion, was puniſhed by the emperors Conſtantius and Julian with confiſcation of goods; to which the emperors Theodoſius and Valentinian added capital puniſhment, in caſe the apoſtate endeavoured to pervert others. A puniſhment too ſevere for any temporal laws to inflict; and yet the zeal of our anceſtors imported it into this country; for we find by Bracton, that in his time apoſtates were to be burnt to death. Doubtleſs, the preſervation of Chriſtianity, as a national religion, is, abſtracted from its own intrinſic truth, (and without entering upon the queſtion reſpecting eſtabliſhments of religion,) of the utmoſt conſequence to the civil ſtate; which a ſingle inſtance will ſufficiently demonſtrate. The belief of a future ſtate of rewards and puniſhments, the entertaining juſt ideas of the moral attributes of the Supreme Being, and a firm perſuaſion that he ſuperintends, and will finally compenſate every action in human life (all which are clearly revealed in the doctrines, and forcibly inculcated by the precepts, of our Saviour Chriſt,) theſe are the grand foundation of all judicial oaths; which call God to witneſs the truth of thoſe facts, which perhaps may be only known to him and the party atteſting: all moral evidence, therefore, all confidence in human veracity, muſt be weakened by apoſtaſy, and overthrown by total infidelity.—Wherefore all affronts on Chriſtianity, or endeavours to depreciate its efficacy, in thoſe who have once profeſſed it, are highly deſerving of cenſure. But yet the loſs of life is a heavier penalty than the offence, taken in a civil light, deſerves; and, taken in a ſpiritual light, our laws have no juriſdiction over it. This puniſhment, therefore, has long ago become obſolete; and the offence of apoſtaſy was for a long time the object only of the eccleſiaſtical courts, which corrected the offender *pro ſalute animæ*. But about the cloſe of the 17th century, the civil liberties to which we were then reſtored, being uſed as a cloak of licentiouſneſs, and doctrines, ſubverſive of all religion, being publicly avowed, both in diſcourſe and writings, it was thought neceſſary again, for the civil power to interpoſe, by not admitting thoſe miſcreants to the privileges of ſociety, who maintained ſuch principles as deſtroyed all moral obligation. To this end, it was enacted, by ſtatute 9 and 10 W. III. c. 32. That if any perſon, educated in, or having made profeſſion of, the Chriſtian religion, ſhall, by writing, printing, teaching, or adviſed ſpeaking, deny the Chriſtian religion to be true, or the holy Scriptures to be of divine authority, he ſhall, upon the firſt offence, be rendered incapable to hold any office or place of truſt; and, for the ſecond, be rendered incapable of bringing any action, or of being guardian, executor, legatee, or purchaſer of lands, and ſhall ſuffer three years impriſonment without bail. To give room, however, for repentance, if, within four months after the firſt conviction, the delinquent will, in open court, publicly renounce his error, he is diſcharged, for that once, from all diſabilities.

APOSTATA CAPIENDO, in the Engliſh law, a writ that formerly lay againſt a perſon who, having entered into ſome order of religion, broke out again, and wandered up and down the country.

APOSTATARE LEGES. See APOSTARE LEGES.

(1.) * APOSTATE. *n. ſ.* [*apoſtata*, Lat. ἀποστάτης.] One that has forſaken his profeſſion; generally applied to one that has left his religion.—The angels, for diſobedience, thou haſt reſerved to a miſerable immortality; but unto man, equally rebellious, equally *apoſtate from* thee and goodneſs, thou haſt given a Saviour. *Rogers's Sermons.*—*Apoſtates*, in point of faith, are, according to the civil law, ſubject unto all puniſhments ordained againſt hereticks. *Ayliffe.*

(2.) APOSTATE, among the Romaniſts, ſignifies a man, who, without a legal diſpenſation, forſakes a religious order, of which he had made profeſſion.

* APOSTATICAL. *adj.* [from *apoſtate.*] After the manner of an apoſtate.—To wear turbants is an *apoſtatical* conformity. *Sandys.*

* *To* APOSTATIZE. *v. n.* [from *apoſtate.*] To forſake one's profeſſion; it is commonly uſed of one who departs from his religion.—None revolt from the faith; becauſe they muſt not look upon a woman to luſt after her, but becauſe they are reſtrained from the perpetration of their luſts. If wanton glances, and libidinous thoughts, had been permitted by the goſpel, they would have *apoſtatized* nevertheleſs. *Bentley.*

APOSTEM, or APOSTEMA. } See APOSTEME, and APOSTUMS.

* *To* APOSTEMATE. *v. n.* [from *apoſteme.*] To become an apoſteme; to ſwell and corrupt into matter.—There is care to be taken in abſceſſes of the breaſt and belly, in danger of breaking inwards; yet, by opening theſe too ſoon, they ſometimes *apoſtemate* again, and become crude. *Wiſeman.*

* APOSTEMATION. *n. ſ.* [from *apoſtemate.*] The formation of an apoſteme; the gathering of a hollow purulent tumour.—Nothing can be more admirable, than the many ways nature hath provided for preventing, or curing of fevers; as, vomitings, *apoſtemations*, ſalivations, *&c. Crew.*

* APOSTEME, APOSTUME. *n. ſ.* [ἀπόστημα.] A hollow ſwelling, filled with purulent matter; an abſceſs.—With equal propriety we may affirm, that ulcers of the lungs, or *apoſtemes* of the brain, do happen only in the left ſide. *Browne.*

APOSTERIGMA, [from ἀπο, and στηρίζω, I ſupport,]

port,] in the ancient phyſic, denotes a ſupport for a diſeaſed part, without binding.

A POSTERIORI, or demonſtration *à poſteriori*. See DEMONSTRATION.

APOSTIL, APOSTILLA, in literary matters, a marginal note to a book.

(I. 1.) * APOSTLE. *n.ſ.* [*apoſtulus*, Lat. ἀποστολος.] A perſon ſent with mandates by another. It is particularly applied to them, whom our Saviour deputed to preach the goſpel.—I am far from pretending infallibility; that would be to erect myſelf into an *apoſtle*: a preſumption in any one that cannot confirm what he ſays by miracles. *Locke.*—We know but a ſmall part of the notion of an *apoſtle*, by knowing barely that he is ſent forth. *Watt's Logick.*

(2.) APOSTLE, in the Greek liturgy, is uſed for a book containing the Epiſtles of St Paul, printed in the order wherein they are to be read in churches, through the courſe of the year. Another book of the like kind, containing the Goſpels, is called Ευαγγελιον, *Goſpel*. The apoſtle, of late days, has alſo contained the other canonical epiſtles, the Acts of the Apoſtles, and the Revelations. Hence it is alſo called *Acts of the Apoſtles*, Πραξαποστολος: that being the firſt book in it.

(3.) APOSTLES, APPOINTMENT AND MISSION OF THE. Our bleſſed Lord ſelected twelve of his diſciples to be apoſtles. There are various conjectures, as to the reaſon of his chooſing exactly *twelve*. The moſt probable is, that, it might be in alluſion to the 12 patriarchs, as the founders of their ſeveral tribes; or to the 12 chief rulers of thoſe tribes, of which the body of the Jewiſh nation conſiſted. This opinion ſeems to be countenanced, by what our Saviour tells his apoſtles, that, "when the Son of man ſhall ſit in the throne of his glory, *they* alſo ſhall ſit upon 12 thrones, judging the 12 tribes of Iſrael." Our Lord's firſt commiſſion to his apoſtles, was in the 3d year of his public miniſtry, about 8 months after their election; at which time he ſent them out by two and two. They were to make no proviſion of money for their ſubſiſtence, in their journey, but to expect it from thoſe to whom they preached; to declare, that the kingdom of heaven, or the Meſſiah, was at hand: to confirm their doctrine by miracles; to avoid going either to the Gentiles or to the Samaritans, and to confine their preaching to the people of Iſrael. In obedience to their Maſter, the apoſtles went into all the parts of Paleſtine, inhabited by the Jews, preaching the goſpel, and working miracles. The evangelical hiſtory is ſilent as to the particular circumſtances attending the firſt preaching of the apoſtles: and only informs, us, that they returned, and told their Maſter of all that they had done. Their ſecond commiſſion, juſt before our Lord's aſcenſion into heaven, was of a more extenſive nature. They were now ordered to "go and teach ALL nations, baptizing them in the name of the Father, and of the Son, and of the Holy Ghoſt." Accordingly, they began publickly, after our Lord's aſcenſion, to exerciſe the office of their miniſtry, working miracles daily, in proof of their miſſion, and making great numbers of converts to the Chriſtian faith. This alarmed the Jewiſh Sanhedrim; whereupon the apoſtles were apprehended, and, being examined before the high prieſt and elders, were commanded not to preach any more in the name of Chriſt.—But this injunction did not terrify them from perſiſting in their duty; for they continued daily, in the temple, and private houſes, teaching and preaching the goſpel. After the apoſtles had exerciſed their miniſtry for 12 years in Judea, they reſolved to diſperſe themſelves in different parts of the world, and agreed to determine by lot what parts each ſhould take. According to this diviſion, St Peter went into Pontus, Galatia, and ſome places adjacent; St Andrew into the vaſt northern countries of Scythia and Sogdiana; St John into the Leſſer Aſia; St Philip into the Upper Aſia and ſome parts of Scythia and Colchis: St Bartholomew into Arabia Felix; St Matthew travelled into Chaldæa, Perſia, and Parthia: St Thomas into Hyrcania, Bactria, and India; St James the leſs continued in Jeruſalem, of which church he was biſhop, ruling elder, or chief miniſter; St Simon travelled into Egypt, Cyrene, Libya, and Mauritania; St Jude, ſirnamed Thaddeus, or Lebbeus, into Syria and Meſopotamia: and St Matthias, who was choſen in the room of the traitor Judas Iſcariot, into Cappadocia and Colchis. Thus, by the diſperſion of the apoſtles, Chriſtianity was very early planted in a great many parts of the world. We have but very ſhort and imperfect accounts of their travels and actions; excepting thoſe of the apoſtle Paul, who amply ſupplied the place of St James Major, whom Herod murdered. To qualify the apoſtles for the arduous taſk of converting the world to the Chriſtian religion, they were miraculouſly enabled to ſpeak the languages of the ſeveral nations to whom they were to preach; and were endowed with the power of working miracles, in confirmation of the doctrines they taught; gifts which were unneceſſary, and therefore ceaſed, in the after ages of the church. St Paul is frequently called the apoſtle of the Gentiles, becauſe his miniſtry was chiefly made uſe of for the converſion of the Gentile world, as that of St Peter was for the Jews, who is therefore ſtyled the apoſtle of the circumciſion.

(4.) APOSTLES CREED. See CREED, N° 2.

(5.) APOSTLES, INFERIOR. This appellation was alſo given to the ordinary travelling miniſters of the church.—Thus St Paul, in the epiſtle to the Romans, xvii. 7. ſays, "Salute Andronicus and Junia, my kinſmen and fellow priſoners, who are of note among the apoſtles." This text, however were there none elſe to ſupport it would not be deciſive, as the words "of note *among* the apoſtles," by no means proves, that they *were* apoſtles, and it is evident that Junia being a *woman*, could not be an apoſtle, though ſhe might have been a propheteſs; but Paul in his epiſtle to the Philippians puts the matter beyond a doubt; as in chap. ii. v. 25. he ſtiles Epaphroditus expreſsly their *apoſtle* (Υμων δε αποστολον,) though in our tranſlation, the word is rendered *meſſenger*. Apoſtle was likewiſe a title given to thoſe ſent by the churches to carry their alms to the poor of other churches. This uſage they borrowed from the Jews, who called thoſe whom they ſent on this meſſage by the ſame name; and the function

or

or office itself ἀποστολη. *apoſtole*, q. d. *miſſion*. (See N° II.) Apoſtle is alſo thought by many to have been the original name for biſhops before the denomination *biſhop* was appropriated to their order. Thus Theodoret ſays expreſsly, the ſame perſons were anciently called promiſcuouſly both biſhops and prſbyters, whilſt thoſe who are now called biſhops were called *apoſtles*.

(II.) APOSTLES, MODERN, AND JEWISH.—This appellation is likewiſe given to thoſe perſons by whom the Chriſtian faith was firſt planted in any place. Thus Dionyſius of Corinth is called the *apoſtle of France*; Xavier the *apoſtle of the Indies*, &c. In the Eaſt Indies the Jeſuit miſſionaries are alſo called *apoſtles*. The word is alſo uſed among the Jews for a kind of officer anciently ſent into the ſeveral parts and provinces in their juriſdiction by way of viſitor or commiſſary, to ſee that the laws were duly obſerved, and to receive the monies collected for the reparation of the temple, and the tribute payable to the Romans. The Theodoſian code, lib. xiv. *De Judæis*, call thoſe *Apoſtoli, qui ad exigendum aurum atque argentum a patriarcha certo tempore diriguntur*. Theſe apoſtles were a degree below the officers of the ſynagogue called *patriarchs*, and received their commiſſions from them. Some authors obſerve, that St Paul had borne this office; and that it is this he alludes to in the beginning of the epiſtle to the Galatians; as if he had ſaid, Paul, no longer an apoſtle of the ſynagogue, nor ſent thereby to maintain the law of Moſes, but now an apoſtle and envoy of Jeſus Chriſt, &c. St Jerom, though he does not believe that St Paul had been an apoſtle of this kind, yet imagines that he alludes to it in this paſſage.

(III.) APOSTLES, METALLIC. In the arſenal of Bremen, there are twelve pieces of cannon called the *Twelve Apoſtles*, on a ſuppoſition that the whole world muſt be *convinced* by the *preaching* of ſuch apoſtles!—In one of the churches plundered by the French, during their revolutionary war, there were 12 ſilver images of the apoſtles, as large as life, which theſe *infidel* republicans made no ſcruple of melting down and ſtamping with the image of their goddeſs of liberty; obſerving, at the ſame time, that it was the buſineſs of the apoſtles to *travel*, and not to remain encloiſtered in churches like monks. In this new form, a ſufficient number of them would doubtleſs prove very *perſuaſive* preachers to many people.

(IV.) APOSTLES, in geography, a village, in Hertfordſhire, near Hitching.

* APOSTLESHIP. *n. ſ.* [from *apoſtle*.] The office or dignity of an apoſtle.—God had ordered it, that St Paul hath writ epiſtles: which are all confined within the buſineſs of his *apoſtleſhip*; and ſo contain nothing but points of Chriſtian inſtruction. *Locke*.

APOSTOLÆUM, or APOSTOLIUM, in eccleſiaſtical writers, denotes a church dedicated to, and called by, the name of an apoſtle. Sozomen ſpeaks of the apoſtolæum of St Peter at Rome, and the apoſtolæum of St Peter and St Paul at Quercus, near Chalcedon.

APOSTOLARE, APOSTOLICARE, apoſtolizing, in writers of the middle age, denotes the being preferred to the dignity of pope!

APOSTOLATE, in a general ſenſe, is uſed for miſſion; and thus Olearus has a diſcourſe concerning the apoſtolate of Chriſt. But the word more properly denotes the dignity or office of an apoſtle of Chriſt. It is alſo uſed, in ancient writers, for the office of a biſhop; in which ſenſe we meet with ſeveral letters, petitions, requeſts, &c. directed to biſhops under the title of *apoſtolatus veſter, your apoſtolate*. But as the title *apoſtolicus* had been appropriated to the pope, ſo that of *apoſtolate* became at length reſtrained to the ſole dignity of popedom. Every biſhop's ſee was anciently dignified with the title of *ſedes apoſtolica*, an apoſtolical ſee, which is now the peculiar denomination of the ſee of Rome.

APOSTOLE, a tribute ſent by the Jews to the Roman Emperors, and remitted to them by Julian the apoſtate. See APOSTLES, N° II.

APOSTOLI, in law, letters miſſive, demanded in appeals.

APOSTOLIANS. See APOSTOOLIANS.

(1.) APOSTOLIC, } ſomething that relates to
APOSTOLICAL, } the apoſtles, or deſcends from them. Thus we ſay, the *apoſtolic* age *apoſtolical* doctrine, &c. Apoſtolic, in the primitive church, was an appellation given to all ſuch churches as were founded by the apoſtles; and even to the biſhops of thoſe churches, as being the reputed ſucceſſors of the apoſtles.—Theſe were 4, viz. Rome, Alexandria, Antioch, and Jeruſalem. In after-times, other churches aſſumed the ſame quality, on account, principally, of the conformity of their doctrine with that of the churches which were apoſtolical by foundation, and becauſe all biſhops held themſelves ſucceſſors of the apoſtles, or acted in their dioceſes with the authority of apoſtles. The firſt time the term *apoſtolical* is attributed to biſhops, as ſuch, is in a letter of Clovis to the council of Orleans, held in 511, though that king does not there expreſsly denominate them *apoſtolical*, but *(apoſtolica ſede dignifſimi)* highly worthy of the apoſtolical ſee. In 581, Guntrami calls the biſhops, met at the council of Maſon, *apoſtolici pontifices* apoſtolic pontiffs. In progreſs of time, the biſhop of Rome growing in power above the reſt, and the three patriarchates of Alexandria, Antioch, and Jeruſalem, falling into the hands of the Saracens, the title *apoſtolical* was reſtricted to the pope and his church alone. Though ſome of the popes and St Gregory the Great, not centented to hold the title by this tenure, began, at length, to inſiſt, that it belonged to them by another and peculiar right, as being the ſucceſſors of St Peter. The country of Rheims in 1049, declared that the pope was the ſole apoſtolical primate of the univerſal church. And hence a great number of apoſtolicals; *apoſtolical* ſee, *apoſtolical* nuncio, *apoſtolical* notary, *apoſtolical* brief, *apoſtolical* chamber, *apoſtolical* vicar, &c.

(2.) * APOSTOLICAL, *adj.* [from *apoſtolick*.] Delivered or taught by the apoſtles; belonging to the apoſtles.—They acknowledge not, that the church keeps any thing as *apoſtolical*, which is not found in the apoſtles writings, in what other records ſo ever it be found. *Hooker*.

(3.) APOSTOLICAL CLERKS. See JESUITS.

(4.) APOSTOLICAL CONSTITUTIONS. See CONSTITUTION.

(5.) APOS-

(5.) APOSTOLICAL FATHERS is an appellation usually given to the writers of the first century, who employed their pens in the cause of Christianity. Of these writers, Cotelerius, and after him Le Clerc, have published a collection in two volumes, accompanied both with their own annotations, and the remarks of other learned men.

(6.) APOSTOLICAL TRADITIONS. See TRADITION.

* APOSTOLICALLY. *adv.* [from *apostolical.*] In the manner of the apostles.

* APOSTOLICALNESS. *n. f.* [from *apostolical.*] The quality of relating to the apostles; apostolical authority.

APOSTOLICI, or APOSTOLICS, a name assumed by three different sects, on account of their pretending to imitate the practice of the apostles. 1. The first apostolici, called APOTACTITÆ and APOTACTICI, rose out of the Encratitæ, and Cathari, in the 3d century. They made profession of abstaining from marriage, and the use of wine, flesh, money, &c. 2. Gerhard Sagarelli was the founder of the second sect. He obliged his followers to go from place to place, as the apostles did, to wander about, clothed in white, with long beards, dishevelled hair, and bare heads, accompanied with women, whom they called their spiritual sisters. They likewise renounced all kinds of property and possessions, inveighed against the growing corruption of the church of Rome, predicted its overthrow, and the establishment of a purer church on its ruins. Sagarelli was burnt alive at Parma, in 1300, and was succeeded by Dulcinus, who added to the character of an apostle, those of a prophet, and a general, and carried on a bloody war for more than two years, against Raynerius, bishop of Vercelli. He was at length defeated, and put to death in a barbarous manner, A. D. 1307. This sect, however, subsisted in France, Germany, and in other countries, till the beginning of the 15th century, when it was totally extirpated under Boniface IX. 3. The last apostolici were of the 12th century. These also condemned marriage, preferring celibacy, and calling themselves the chaste brethren and sisters; though each was allowed a spiritual sister, with whom he lived in a domestic relation; and on this account they have been charged with concubinage: they held it unlawful to take an oath; they set aside the use of baptism; and in many things imitated the Manichees. Bernard wrote against this sect.

* APOSTOLICK. *adj.* [from *apostle.* The accent is placed by Dryden on the antipenult.] Taught by the apostles; belonging to an apostle. —Their oppositions in maintenance of public superstition against *apostolick* endeavours, were vain and frivolous. *Hooker.*—

Or where did I at sure tradition strike,
Provided still it were *apostolick?* *Dryden.*

APOSTOLICUM, a peculiar kind of song or hymn, anciently used in churches. The apostolicum is mentioned by Greg. Thaumaturgus, as used in his time. Vossius understands it as spoken of the apostles creed: Suicer thinks this impossible, this creed being then unknown in the churches of the east.

APOSTOLIUS, Michael, a learned Greek of the 15th century. He wrote a collection of apophthegms of wise men, and another of proverbs, but only abridgments of them have been published; of the former in 1619, and of the latter in 1538.

APOSTOLORUM UNGUENTUM, the apostles ointment, in pharmacy, is a kind of detergent, or cleansing unguent, composed of 12 drugs, whence its name. It was invented by Avicenna, and is also called *unguentum veneris.* The ingredients are turpentine, wax, gum ammoniac, birth wort roots, olibanum, bdellium, myrrh and galbanum, opoponax, verdigris, lithrage, oil of olives, and vinegar.

APOSTOOL, a minister among the Mennonites at Amsterdam, who founded a new sect. See next article.

APOSTOOLIANS, a sect of the Mennonites, which first sprung up in 1664, and derived its name from Apostool. See last article. They concurred with the Mennonites in doctrine, and admitted to their communion those only who professed to believe all the sentiments contained in their public confession of faith. See MENNONITES.

(1.) * APOSTROPHE. *n. f.* [ἀποστροφὴ from ἀπὸ, from, and στρέφω, to turn.] 1. In rhetorick, a diversion of speech to another person than the speech appointed did intend or require; or, it is a turning of the speech from one person to another, many times abruptly. A figure, when we break off the course of our speech, and speak to some new person, present or absent, as to the people or witnesses, when it was before directed to the judges, or opponent. *Smith's Rhetorick.* 2. In grammar, the contraction of a word by the use of a comma, as *tho'*, for *though*; *rep'*, for *reputation* —Many laudable attempts have been made, by abbreviating words with *apostrophes*; and by lopping polysyllables, leaving one or two words at most. *Swift.*

(2.) APOSTROPHE, in grammar, is also used as a sign of the genitive, or rather as a contraction of the possessive pronoun, (for the English language has properly no cases) where *s*, with an inverted comma before it, stands for *his*: *e.g. Wallace's sword*, for Wallace *his* sword. And here we cannot help expressing our dissent from Dean Swift, (as above quoted by Dr Johnson, § 1.) in thinking the attempts to abbreviate words with apostrophes *laudable.* In fact, it is no small fault of the English language, that it abounds with monosyllables. Dr Chambers justly observes, that "the affectation of frequent apostrophes, so usual among some late English writers, is a great abuse. In prose, apostrophes are indefensible," (except in contracting the possessive pronoun,) "and tend to vitiate the language." They are useful, however in poetry, to reduce a line to the proper measure.

(3.) APOSTROPHE, in medicine, a loathing or food.

(4.) APOSTROPHE, in rhetoric, (above defined, § 1.) is, in boldness, a degree lower than the address to personified objects, (see PERSONIFICATION); since it requires a less effort of imagination to suppose persons present, who are dead or absent, than to animate insensible beings, and direct our discourse to them. The Poems of Ossian

abound with the moſt beautiful inſtances of this figure. "Weep on the rocks of roaring winds, O Maid of Iniſtore! Bend thy fair head over the waves, thou fairer than the ghoſt of the hills, when it moves in a ſun-beam at noon over the ſilence of Morven! He is fallen! Thy youth is low; pale beneath the ſword of Cuchullin!"

* APOSTROPHIZE. *v. n.* [from *apoſtrophe*] To addreſs by an apoſtrophe.—There is a peculiarity in Homer's manner of *apoſtrophiſing* Eunæus; and ſpeaking of him in the ſecond perſon; it is generally applied only to men of account. *Pope.*

APOSTROPHUS. See APOSTROPHE, § 2.

* APOSTUME. *n. ſ.* See APOSTEME. [This word is properly *apoſtem.*] A hollow tumour filled with purulent matter.—How an *apoſtume* in the meſentery breaking, cauſes a conſumption in the parts, is apparent. *Harvey.*

* *To* APOSTUME. *v. n.* [from *apoſtume.*] To apoſtemate. *Dict.*

APOSYRMA, [from απωθεομαι, I take off,] in medicine, denotes a diſquammation or ſcaling of the ſkin; in which ſenſe the word amounts to much the ſame with abraſion.

APOTACTICI, or APOTACTITÆ, [formed from αποτασσω, to renounce,] an ancient ſect, who, affecting to follow the evangelical counſels of poverty, and the examples of the apoſtles, and primitive Chriſtians, renounced all their effects and poſſeſſions. It does not appear, that they fell into any errors during their firſt ſtate: ſome eccleſiaſtical writers aſſure us, they had divers martyrs, under the perſecution of Dioclesian, in the 4th century, but they afterwards fell into the opinion of the Encratitæ, and taught that the renouncing of all riches was not only a matter of advice, but of precept and neceſſity. And therefore the 6th law in the Theodoſian code joins the Apotactitæ with the Eunomians and Arians.

APOTEICHISMUS, [from αποτειχιζω, to raiſe a wall,] in the ancient military art, a line of circumvallation drawn round a place, to beſiege it. It was the firſt operation the ancients performed, when they deſigned to lay cloſe ſiege to a place. It ſometimes conſiſted of a double wall, or rampart, raiſed of earth; the innermoſt to prevent ſudden ſallies from the town; the outermoſt to keep off foreign enemies from coming to the relief of the beſieged. This anſwered to what we call lines of contravallation, and circumvallation, among the moderns.

APOTELESMA, [from αποτελεω, to perform,] an effect of ſome cauſe; alſo a prognoſtic, or prediction of an event; in which ſenſe Scaliger ſpeaks of the *apoteleſmata* of Hippocrates. The anſwers of aſtrologers deduced from the conſiderations of the ſtars are particularly called *apoteleſmata*; which were the expreſſions they uſed to denote the effects of the ſtars and planets on ſublunary bodies.

APOTELESMATICA, the art of foretelling future events, from the aſpects of the heavenly bodies; in which ſenſe, the word amounts to the ſame with judicial aſtrology.

APOTELESMATICAL ASTRONOMY, the ſame with aſtrology.

APOTELESMATICI, aſtrologers.

APOTELISM. See APOTELESMA.

APOTHECARIUS, in writers of the middle age, denotes a ſhop keeper, or warehouſe keeper. Apothecarius is alſo uſed to denote a ſtore keeper, or officer appointed to have the direction of a magazine, granary, &c. In which ſenſe, *apothecarii* is ſometimes rendered by *boreurii* and *rationarii.*

(1.) * APOTHECARY. *n. ſ.* [*apotheca*, Lat. a repoſitory.] A man whoſe employment is to keep medicines for ſale.—Give me an ounce of civet, good *apothecary*, to ſweeten my imagination. *Shakeſpeare's King Lear.*—They have no other doctor but the ſun and the freſh air, and that ſuch an one, as never ſends them to the *apothecary*. *South.*—

Wand'ring in the dark,
Phyſicians, for the tree, have found the bark;
They, lab'ring for relief of human kind,
With ſharpen'd ſight ſome remedies may find;
Th' *apothecary* train is wholly blind. *Dryden.*

(2.) APOTHECARY, [from αποθηκη, a ſhop,] may be alſo defined one who practiſes the art of pharmacy. In London, the apothecaries are one of the city companies. They were incorporated by a charter from king James I. procured at the ſolicitation of Dr Mayerne and Dr Aitkens; till that time they only made a part of the grocers company; plums, ſugar, ſpice, Venice treacle, mithridate, &c. were ſold in the ſame ſhop, and by the ſame perſon. The reaſon of ſeparating them was, that medicines might be better prepared, and in oppoſition to divers perſons, who impoſed unwholeſome remedies upon the people. By an act which was made perpetual in the 9th Geo. I. they are exempted from ſerving upon juries, or in ward and pariſh offices. They are obliged to make up their medicines according to the formulas preſcribed in the college diſpenſatory; and are liable to have their ſhops viſited by the cenſors of the college, who are empowered to deſtroy ſuch medicines as they think not good. They have a hall in Blackfriars, where there are two fine laboratories, out of which all the ſurgeons cheſts are ſupplied with medicines for the Britiſh royal navy. His Majeſty has two apothecaries, whoſe ſalaries are L. 120, and L. 275. To the houſehold belong the other two. The benevolent diſpenſation of medicines by the Chineſe is well deſerving attention. In the public ſquares of their cities they have ſet up a ſtone ten cubits in height, on which they have engraved the names of all ſorts of medicines, with the price affixed to each; and when the poor ſtand in need of any relief from phyſic, they go to the treaſury, where they receive the price of the medicine they want.

* APOTHEGM. *n. ſ.* [properly APOPHTHEGM, which ſee.] A remarkable ſaying.—By frequent converſing with him, and ſcattering ſhort *apothegms*, and little pleaſant ſtories, and making uſeful applications of them, his ſon was, in his infancy, taught to abhor vanity and vice as monſters. *Walton's Life of Saunderſon.*

* APOTHEOSIS. *n. ſ.* [αποθεωσις.] Deification: the rite of adding any one to the number of gods.—As if it could be graved and painted omnipotent, or the nails and the hammer could give it an *apotheoſis*. *South.*—

Aliots

Allots the prince of his celeſtial line,
An *apotheoſis*, and rites divine. *Garth.*

(2.) APOTHEOSIS, CEREMONY AND CONSEQUENCES, &c. OF AN. Among the Romans, the ceremony of deifying their emperors, was, according to Herodian's deſcription, as follows: After the body of the deceaſed had been burnt with the uſual ſolemnities, an image of wax, exactly reſembling him, was placed on an ivory couch, where it lay for ſeven days, attended by the ſenate and ladies of the higheſt quality in mourning; and then the young ſenators and knights bore the bed of ſtate through the via ſacra to the old forum, and from thence to the campus martius, where it was depoſited upon the edifice built in form of a pyramid. The bed being thus placed amidſt a quantity of ſpices and other combuſtibles, and the knights having made a ſolemn proceſſion round the pile, the new emperor, with a torch in his hand, ſet fire to it, whilſt an eagle, let fly from the top of the building, and mounting in the air with a firebrand, was ſuppoſed to convey the ſoul of the deceaſed to heaven; and thenceforeward he was ranked among the gods! We often meet with the conſecration or apotheoſis of emperors repreſented on medals; where we ſee the pyramids of ſeveral ſtories, each growing leſs and leſs; we ſee alſo the eagles flying away with the ſouls of the deceaſed emperors! A gem in the muſæum of Brandenburg, repreſents the apotheoſis of Julius Cæſar, mounted upon the celeſtial globe, and holding an helm in his hand, as if he were now the governor of Heaven, as before of the earth. See DEIFICATION. After the apotheoſis, temples, altars, and images, were erected to the new deity; ſacrifices, &c. were offered, colleges of prieſts inſtituted; and the devotees ſwore by his name! It was one of the doctrines of Pythagoras which he had borrowed from the Chaldees, that virtuous perſons after their death were raiſed to the order of the gods. And hence the ancients deified all the inventors of things uſeful to mankind; and thoſe who had done any important ſervice to the commonwealth. —Tiberius propoſed to the Roman ſenate the apotheoſis of Jeſus Chriſt, as is related by Euſebius, Tertullian, and Chryſoſtom; but the ſenate, though generally very obſequious to the emperor, and extremely ready to adopt the gods of even, conquered nations, did not agree to this propoſal, which was fortunate for Chriſtianity, as modern infidels would have alledged, that the Chriſtians had only adopted one of the Roman idols and rejected the reſt, and would probably have accounted for the early and rapid ſucceſs of the goſpel, by the imperial influence of Tiberius and his ſucceſſors.—Juvenal rallying the frequent apotheoſes, introduces poor Atlas, complaining that he was ready to ſink under the burden of ſo many new gods as were every day added to the heavens.—Seneca ridicules the apotheoſis of Claudius with admirable humour.

(1.) APOTHERAPIA, [from ἀποθεραπεύω, to cure,] in phyſic, properly denotes a complete or finiſhed cure.

(2.) APOTHERAPIA, in the gymnaſtic art, the laſt part of all regular exerciſes, viz. friction or unction with oil, before and after bathing; partly to cleanſe the ſkin from any filth or duſt it might have contracted during the exerciſe, and partly to remove wearineſs.

APOTHERMUM, [from ἀπὸ, and θέρμη, hot,] in ancient writers, a ſharp kind of ſauce, prepared of muſtard, oil, and vinegar, or of vinegar alone.

* APOTOME. *n. ſ.* [from ἀποτέμνω, to cut off.] 1. In mathematicks, the remainder or difference of two incommenſurable quantities. 2. In muſick, it is the part remaining of an entire tone, after a greater ſemitone has been taken from it. The proportion in numbers of the *apotome*, is that of 2048 to 2187. The Greeks thought the greater tone could not be divided into two equal parts; for which reaſon they called the firſt part ἀποτομὴ, and the other λῆμμα. *Chambers.*

APOTRAGOPOGON, in the materia medica, a name given by ſome of the old authors to the LADANUM.

APOTREPÆA, [from ἀποτρέπω, to avert,] in the ancient poetry, verſes compoſed for averting the wrath of incenſed deities.

APOTREPÆAN GODS, Deities invoked to avert any threatened misfortune; called alſo ALEXIACI and AVERRUNCI.

(1.) * APOZEM. *n. ſ.* [ἀπὸ, from and ζέω, to boil.] A decoction; an infuſion made by boiling ingredients.—During this evacuation, he took opening broths and apozems. *Wiſeman's Surgery.*—

Squirts read Garth 'till *apozems* grow cold.
Gay.

(2.) APOZEM, in medicine. See DECOCTION.

* *To* APPAL. *v. a.* [*apaler*, Fr. It might more properly have been written *appale.*] To fright; to ſtrike with ſudden fear; to depreſs; to diſcourage.—

Whilſt ſhe ſpake, her great words did *appal*
My feeble courage, and my heart oppreſs,
That yet I quake and tremble over all.
Fairy Queen.

Give with thy trumpet a loud note to Troy,
Thou dreadful Ajax; that th' *appalled* air
May pierce the head of thy great combatant.
Shakeſpeare.

—The houſe of peers was ſomewhat *appalled* at this alarm; but took time to conſider of it till next day. *Clarendon.*—

Does neither rage inflame, nor fear *appal*,
Nor the black fear of death that ſaddens all?
Pope.

APPALACHI. See APALACHI.

APPALACHIAN MOUNTAINS. See APALACHIAN MOUNTAINS.

APPALACHICOLA. See APALACHICOLA.

APPALADRI, a river of Eaſt Florida, which falls into the Gulf of Mexico, near St Mark.

* APPALEMENT. *n. ſ.* [from *appal.*] Depreſſion; diſcouragement; impreſſion of fear.—As the furious ſlaughter of them was a great diſcouragement and *appalement* to the reſt. *Bacon's Henry VIII.*

APPAMATOX, a river of Virgina, which riſes in the Long Mountain and falls into James river, below Richmond.

* APPANAGE. *n. ſ.* [*appanagium*, low Latin; probably from *panis*, bread.] Lands ſet apart by princes for the maintenance of their younger

children.—He became ſuitor for the earldom of Cheſter, a kind of *appanage* to Wales, and uſing to go to the king's ſon. *Bacon.*—

Had he thought it fit,
That wealth ſhould be the *appanage* of wit,
The God of light could ne'er have been ſo blind,
To deal it to the worſt of human kind. *Swift.*

APPARATOR. See APPARITOR.

(1.) * APPARATUS. *n. ſ.* [Latin.] Things provided as means to any certain end, as the tools of a trade; the furniture of a houſe; ammunition for war; equipage; ſhow.—There is an *apparatus* of things previous, to be adjuſted before I come to the calculation itſelf. *Woodward.*—Ourſelves are eaſily provided for; it is nothing but the circumſtantials, the *apparatus* or equipage of human life, that coſts ſo much. *Pope's Letters to Gay.*

(2.) APPARATUS, in literary matters, is a title of books in the form of catalogues, bibliothecas, dictionaries, &c. for the eaſe and conveniency of ſtudy. The apparatus to Cicero is a kind of concordance, or collection of Ciceronian phraſes, &c. The *apparatus ſacer* of Poſſevin, is a collection of all kinds of eccleſiaſtical authors printed in 1611, in 3 volumes.—Gloſſaries, comments, &c. are alſo frequently called *apparatuſes.*

(3.) APPARATUS, in ſurgery, the bandages, medicaments, and dreſſings of a part; or the ſeveral matters applied for the cure of a wound, ulcer, or the like. The word is alſo uſed for the operation of cutting for the ſtone. For this there are 3 ſorts of apparatus, viz. the ſmall, great, and high apparatus. See SURGERY.

* APPAREL. *n. ſ. It has no plural.* [*appareil*, Fr.] 1. Dreſs; veſture.—I cannot cog and ſay, that thou art this and that, like many of thoſe liſping hawthorn buds, that come like women in men's *apparel*, and ſmell like Bucklerſbury in ſimpling time. *Shakeſpeare's Merry Wives of Windſor.* 2. External habiliments.—

Our late burnt London, in *apparel* new,
Shook off her aſhes to have treated you. *Waller.*

—At public devotion, his reſigned carriage made religion appear in the natural *apparel* of ſimplicity. *Tatler.*

* *To* APPAREL. *v. a.* [from *apparel*, the noun.] 1. To dreſs; to cloath.—With ſuch robes were the king's daughters that were virgins *apparelled.* 2 *Sam.* xiii. 18.—Both combatants were *apparelled* only in their doubtlets and hoſes. *Hayward.* 2. To adorn with dreſs.—She did *apparel* her apparel, and with the preciouſneſs of her body made it moſt ſumptuous. *Sidney.* 3. To cover or deck, as with dreſs.—You may have trees *apparelled* with flowers, by boring holes in them, and putting into them earth, and ſetting ſeeds of violets. *Bacon.*—Shelves, and rocks, and precipices, and gulfs, being *apparelled* with a verdure of plants, would reſemble mountains and valleys. *Bentley's Sermons.* 4. To fit out; to furniſh; not in uſe.—It hath been agreed, that either of them ſhould ſend ſhips to ſea well manned and *apparelled* to fight. *Sir J. Hayward.*

APPARELMENT, [from *appareo*, to appear.] reſemblance. *Bailey.*

(1.) * APPARENT. *adj.* [*apparent*, Fr. *apparens*, Lat.] 1. Plain; indubitable; not doubtful.—The main principles of reaſon are in themſelves *apparent.* For to make nothing evident of itſelf unto man's underſtanding, were to take away all poſſibility of knowing any thing. *Hooker.* 2. Seeming; in appearance; not real.—The perception intellective often corrects the report of phantaſy, as in the *apparent* bigneſs of the ſun, the *apparent* crookedneſs of the ſtaff in air and water. *Hale's Origin of Mankind.* 3. Viſible; in oppoſition to *ſecret.*—What ſecret imaginations we entertained is known to God; this is *apparent*, that we have not behaved ourſelves, as if we preſerved a grateful remembrance of his mercies. *Atterbury.*—The outward and *apparent* ſanctity of actions ſhould flow from purity of heart. *Rogers.* 4. Open; evident; not known; merely ſuſpected.—

As well the fear of harm, as harm *apparent*,
In my opinion ought to be prevented. *Shak.*

5. Certain; not preſumptive.—

He is the next of blood,
And heir *apparent* to the Engliſh crown. *Shak.*

(2.) APPARENT, among aſtronomers and mathematicians, denotes things as they appear to us, in contradiſtinction from real or true; thus we ſay, the apparent diameter, diſtance, magnitude, place, figure, &c. of bodies.

(3.) * APPARENT. *n. ſ.* Elliptically uſed for *heir apparent.*—

Draw thy ſword in right.——
—I'll draw it as *apparent* to the crown,
And in that quarrel uſe it. *Shak. Henry VI.*

(4.) APPARENT CONJUNCTION of the planets is, when a right line, ſuppoſed to be drawn through the centre of two planets, does not paſs through the centre of the earth, but through the eye of the ſpectator.

(5.) APPARENT HEIRS, in law, are ſuch, whoſe right of inheritance is indefeaſible, provided they outlive the anceſtors; as the eldeſt ſon or his iſſue, who muſt by the courſe of the common law be heirs to the father whenever he happens to die. Heirs *preſumptive* are ſuch, who, if the anceſtor ſhould die immediately, would in the preſent circumſtance of things be his heirs: but whoſe right of inheritance may be defeated by the contingency of ſome nearer heir being born; as a brother or nephew, whoſe preſumptive ſucceſſion may be deſtroyed by the birth of a child; or daughter, whoſe preſent hopes may be hereafter cut off by the birth of a ſon. Nay, even if the eſtate hath deſcended, by the death of the owner, to ſuch brother, or nephew, or daughter; in the former caſes, the eſtate ſhall be diveſted and taken away by the birth of a poſthumous child; and, in the latter, it ſhall alſo be totally diveſted by the birth of a poſthumous ſon.

* APPARENTLY. *adv.* [from *apparent.*] Evidently; openly.—

Arreſt him, officer;
I would not ſpare my brother in this caſe,
If he ſhould ſcorn me ſo *apparently.*
Shak. Comedy of Err.

—Vices *apparently* tend to the impairing of health. *Tillotſon.*

(1.) * APPARITION. *n. ſ.* [from *appareo*, Lat. to appear.] 1. Appearance; viſibility.—

When ſuddenly ſtood at my head a dream,
Whoſe inward *apparition* gently mov'd
My fancy,

—My

—My retirement tempted me to divert thoſe melancholy thoughts which the new *apparitions* of foreign invaſion and domeſtic diſcontent gave us. *Denham.* 2. The thing appearing; a form; a viſible object.—

I have mark'd
A thouſand bluſhing *apparitions*
To ſtart in her face; a thouſand innocent ſhames
In angel whiteneſs bear away thoſe bluſhes.
Shakeſpeare.

A glorious *apparition!* had no doubt,
And carnal fear, that day dimm'd Adam's eyes.
Milton.

—Any thing beſides may take from the ſenſe of what appeared; which *apparition* it ſeems was you. *Tatler.* 3. A ſpectre; a walking ſpirit.—

Horatio ſays 'tis but our phantaſy,
Touching this dreaded ſight twice ſeen of us;
Therefore I have entreated him,
That if again this *apparition* come,
He may approve our eyes, and ſpeak to it. *Sha.*

—Tender minds ſhould not receive early impreſſions of Goblins, ſpectres, and *apparitions* wherewith maids fright them into compliance. *Locke.*—One of thoſe *apparitions* had his right hand filled with darts, which he brandiſhed in the face of all who come up that way. *Tatler.* 4. Something only apparent, not real.—

Still there's ſomething
That checks my joys———
—Nor can I yet diſtinguiſh
Which is an *apparition*, this or that. *Denham.*

5. Aſtronomically, the viſibility of ſome luminary, oppoſed to *occultation.*—A month of *apparition* is the ſpace wherein the moon appeareth, deducting three days wherein it commonly diſappeareth; and this containeth but twenty-ſix days and twelve hours. *Brown's Vulgar Errours.*

(2.) APPARITION, in aſtronomy, denotes a ſtar or other luminary becoming viſible, which before was hid. The heliacal riſing is rather an *apparition* than a proper riſing.

(3.) APPARITIONS, INQUIRY CONCERNING THE REALITY OF. Several inſtances of apparitions occur in the Bible; that of Samuel, raiſed by the witch of Endor, has occaſioned great diſputes. We find great controverſies among authors, in relation to the reality, the exiſtence or non-exiſtence, the poſſibility or impoſſibility, of apparitions. The Chaldeans, the Jews, and other nations, have been the ſteady aſſerters of the belief of apparitions. The denial of ſpirits and apparitions is by ſome made one of the marks of infidelity, if not of atheiſm. Many of the apparitions we are told of in writers, are doubtleſs mere deluſions of the ſenſe; many others are fictitious, contrived merely to amuſe, or anſwer ſome purpoſe. Apparitions, it is certain, are machines that on occaſion have been of good ſervice both to generals, to miniſters of ſtate, to prieſts and others. Partial darkneſs, or obſcurity, are the moſt powerful means by which the ſight is deceived: night is therefore the proper ſeaſon for apparitions. Indeed the ſtate of the mind, at that time, prepares it for the admiſſion of theſe deluſions of the imagination. The fear and caution which muſt be obſerved in the night; the opportunity it affords for ambuſcades and aſſaſſinations; depriving us of ſociety, and cutting off many pleaſing trains of ideas, which objects in the light never fail to introduce, are all circumſtances of terror: and perhaps, on the whole, ſo much of our happineſs depends upon our ſenſes, that the deprivation of any one may be attended with proportionable horror and uneaſineſs. The notions entertained by the ancients reſpecting the ſoul, may receive ſome illuſtration from theſe principles. In dark or twilight, the imagination frequently transforms an animate body into a human figure; on approaching, the ſame appearance is not to be found; hence they ſometimes fancied they ſaw their anceſtors; but not finding the reality, diſtinguiſhed theſe illuſions by the name of *ſhades.* Many of theſe fabulous narrations might originate from dreams. There are times of ſlumber when we are not ſenſible of being aſleep. On this principle, Hobbes has ingeniouſly accounted for the ſpectre which is ſaid to have appeared to Brutus. "We read," ſays he, "of M. Brutus, that at Philippi, the night before he gave battle to Auguſtus Cæſar, he ſaw a fearful apparition, which is commonly related by hiſtorians as a viſion; but, conſidering the circumſtances, one may eaſily judge it to have been but a ſhort dream. For ſitting in his tent, penſive and troubled with the horror of his raſh act, it was not hard for him, ſlumbering in the cold, to dream of that which moſt affrighted him; which fear, as by degrees it made him wake, ſo it muſt needs makes the apparition by degrees to vaniſh: and having no aſſurance that he ſlept, he could have no cauſe to think it a dream, or any thing but a viſion."—The well known ſtory told by Clarendon, of the apparition of the Duke of Buckingham's father will admit of a ſimilar ſolution. There was no man in the kingdom ſo much the ſubject of converſation as the Duke; and from the corruptneſs of his character, he was very likely to fall a ſacrifice to the enthuſiaſm of the times. Sir George Villiers is ſaid to have appeared to the man at midnight: therefore there is the greateſt probability that the man was aſleep: and the dream affrighted him, made a ſtrong impreſſion, and was likely to be repeated.

(1.) APPARITOR, in ſome ancient Engliſh laws, a judge or juſtice.

(2.) APPARITOR COMITATUS. There was formerly an office thus entitled, for which the ſheriffs of Buckinghamſhire had a conſiderable yearly allowance; and in the reign of queen Elizabeth, there was an order of court for making that allowance. But the cuſtom and reaſon of it are now altered.

(3.) APPARITORS, among the ancient Romans, were the ſame with ſerjeants or tipſtaffs among us; or rather apparitor was a general term, and compriſed under it all the miniſters and attendants of the judges and magiſtrates, appointed to receive and execute their orders; from the *accenſus* down to the *carnifex*, or hangman. Hence, the name was derived, viz. from *apparere*, to be preſent, to be in waiting. They were uſually choſen out of the freedmen of the magiſtrates, and their condition was held in ſo much contempt, that, as a mark of ignominy, the ſenate appointed a city that had revolted from them to furniſh them with apparitors.

(4.) * APPARITORS. *n. ſ.* [from *appareo*, Lat. to be at hand.] 1. Such perſons as are at hand to execute the proper orders of the magiſtrate or judge of any court of judicature. *Ayliffe.* 2. The loweſt officer of the eccleſiaſtical court.—They ſwallowed all the Roman hierarchy, from the pope to the *apparitor*. *Ayliffe's Parergon.*

APPARTMENT. See APARTMENT.

APPATURA, in old law, furniture.

APPAUMEE. See APAUME.

* *To* APPAY. *v. a.* [*appayer*, old Fr. to ſatisfy.] 1. To ſatisfy; to content: whence *well appayed*, is *pleaſed*; *ill appayed*, is *uneaſy*. It is now obſolete.—

How well *appaid* ſhe was her bird to find? *Sidney.*

—I am well *appaid* that you had rather believe, than take the pain of a long pilgrimage. *Camden.*—

So only can high juſtice reſt *appaid*. *Milton.*

2. The ſenſe is obſcure in theſe lines:—

Ay, Willy, when the heart is ill aſſay'd,
How can bagpipe or joints be well *appaid*?
Spenſer.

* *To* APPEACH. *v. a.* 1. To accuſe; to inform againſt any perſon.—He did, amongſt many others, *appeach* Sir William Stanley. *Bacon.*—

Were he twenty times
My ſon, I would *appeach* him. *Shak. Rich.* II.

Diſcloſe
The ſtate of your affection; for your paſſions
Have to the full *appeached*. *Shakeſpeare.*

2. To cenſure; to reproach; to taint with accuſation.—

For when Cymochles ſaw the foul reproach,
Which them *appeached*; prick'd with guilty ſhame,
And inward grief, he fiercely gen approach,
Reſolv'd to put away that lordly ſhame. *Fairy Q.*

Nor canſt, nor durſt thou, traitor, on the pain,
Appeach my honour, or thine own maintain.
Dryden.

* APPEACHMENT. *n. ſ.* [from *appeach*.] Charge exhibited againſt any man; accuſation.—A buſy headed man gave firſt light to this *appeachment*; but the earl did avouch it. *Hayward.*—The duke's anſwers to his *appeachments*, in number thirteen, I find civilly couched. *Wotton.*

(1.) * APPEAL. *n. ſ.* [from the verb *To appeal*.] 1. An *appeal* is a provocation *from* an inferior *to* a ſuperior judge, whereby the juriſdiction of the inferior judge is for a while ſuſpended, in reſpect of the cauſe; the cogniſance being devolved to the ſuperior judge. *Ayliffe's Parergon.*—

This ring
Deliver them, and your *appeal* to us
There make before them. *Shakeſp. Henry* VIII.

Our reaſon prompts us to a future ſtate,
The laſt *appeal from* fortune and *from* fate,
Where God's all righteous ways will be declar'd.
Dryden.

—There are diſtributer's of juſtice, *from* whom there lies an *appeal to* the prince. *Addiſon.* 2. In the common law.—An accuſation; which is a lawful declaration of another man's crime before a competent judge, by one that ſets his name to the declaration, and undertakes to prove it, upon the penalty that may enſue of the contrary; more commonly uſed for the private accuſation of a murderer, by a party who had intereſt in the party murdered, and of any felon, by one of his accomplices in the fact. *Cowel.*—

Haſt thou, according to thy oath and bond,
Brought hither Henry Hereford, thy bold ſon,
Here to make good the boiſt'rous late *appeal*
Againſt the duke of Norfolk? *Shakeſpeare.*

3. A ſummons to anſwer a charge.—

Nor ſhall the ſacred character of king
Be urg'd to ſhield me from my bold *appeal*,
If I have injur'd thee, that makes us equal. *Dryd.*

4. A call upon any as witneſs.—The caſting up of the eyes, and lifting up of the hands, is a kind of *appeal* to the Deity, the authour of wonders. *Bacon.*

(2.) APPEAL, in law, the removal of a cauſe from an inferior to a ſuperior court or judge, when a perſon thinks himſelf aggrieved by the ſentence of the inferior judge. Appeals lie from all the ordinary courts of juſtice to the Houſe of Lords. In eccleſiaſtical caſes, if an appeal is brought before a biſhop, it may be removed to the archbiſhop; if before an archdeacon, to the court of arches, and thence to the archbiſhop; and from the archbiſhop's court to the king in chancery. Appeal, in common law, denotes an accuſation by a private ſubject againſt another, for ſome heinous crime; demanding puniſhment on account of the particular injury ſuffered, rather than for the offence againſt the public. This private proceſs, for the puniſhment of public crimes, had probably its original in thoſe times, when a private pecuniary ſatisfaction, called a *weregild*, was conſtantly paid to the party injured, or his relations, to expiate enormous offences. This was a cuſtom derived to the Engliſh, in common with other northern nations, from their anceſtors the ancient Germans: among whom, according to Tacitus, *luitur homicidium certo armentorum ac pecorum numero; recipitque ſatisfactionem univerſa domus.* In the ſame manner by the Iriſh Brehon law, in caſe of murder, the brehon or judge was uſed to compound between the murderer and the friends of the deceaſed who proſecuted him, by cauſing the malefactor to give unto them, or to the child or wife of him that was ſlain, a recompence which they called an *eriach*. And thus we find in the Anglo-Saxon laws (particularly thoſe of king Athelſtan) the ſeveral weregilds for homicide eſtabliſhed in progreſſive order, from the death of the ceorl or peaſant, up to that of the king himſelf. And in the laws of Henry I. we have an account of what other offences were redeemable by weregild, and what was not ſo. As therefore, during the continuance of this cuſtom, a proceſs was certainly given, for recovering the weregild by the party to whom it was due; it ſeems that, when theſe offences by degrees grew no longer redeemable, the private proceſs was ſtill continued, in order to inſure the infliction of puniſhment upon the offender, though the party injured was allowed no pecuniary compenſation for the offence. But though appeals were thus, in the nature of proſecutions for ſome atrocious injury, committed more immediately againſt an individual, yet it was alſo anciently permitted, that any ſubject might appeal another ſubject of high-treaſon, either in the courts of common law, or in parliament, or (for treaſons committed beyond the ſeas) in the court of the high conſtable and marſhal. The

cogni-

cognizance of appeals in the latter ſtill continues in force; and ſo late as 1631, there was a trial by battle awarded in the court of chivalry, on ſuch an appeal of treaſon: but that in the firſt was *virtually* aboliſhed by the ſtatutes 5 Edw. III. c. 9. and 2 Edw. III. c. 24. and in the ſecond *expreſsly* by ſtatute 1 Hen. IV. 14. So that the only appeals now in force, for things done within the realm, are appeals of felony and mayhem. An appeal of felony may be brought for crimes committed either againſt the parties themſelves or their relations. The crimes againſt the parties themſelves are *larceny*, *rape*, and *arſon*. And for theſe, as well as for mayhem, the perſons robbed, raviſhed, maimed, or whoſe houſes are burnt, may inſtitute this private proceſs. The only crime againſt one's relation, for which an appeal can be brought, is that of *killing* him, by either murder or manſlaughter. But this cannot be brought by every relation; but only by the wife for the death of her huſband, or by the heir-male for the death of his anceſtor; which heirſhip was alſo confined by an ordinance of Henry I. to the four neareſt degrees of blood. It is given to the wife, on account of the loſs of her huſband; therefore, if ſhe marries again, before or pending her appeal, it is loſt and gone; or, if ſhe marries after judgement, ſhe ſhall not demand execution. The heir, as was ſaid, muſt alſo be heir-male, and ſuch a one as was the next heir by the courſe of the common law at the time of the killing of the anceſtor. But this rule has three exceptions: 1. If the perſon killed leaves an innocent wife, ſhe only, and not the heir, ſhall have the appeal: 2. If there be no wife, and the heir be accuſed of the murder, the perſon, who next to him would have been heir-male, ſhould bring the appeal: 3. If the wife kills her huſband, the heir may appeal her of the death. And, by the ſtatute of Glouceſter. 6 Ed. I. c. 19. all appeals of death muſt be ſued within a year and a day after the completion of the felony by the death of the party: which ſeems to be only declaratory of the old common law; for in the Gothic conſtitutions we find the ſame "*præſcriptio annalis, quæ currit adverſus actorem, ſi de homicida ei non conſtat intra annum a cæde facta, nec quenquam interea arguat et accuſet.*" Theſe appeals may be brought previous to any indictment; and, if the appellee be acquitted thereon, he cannot be afterwards indicted for the ſame offence. In like manner as by the old Gothic conſtitution, if any offender gained a verdict in his favour, when proſecuted by the party injured, he was alſo underſtood to be acquitted of any crown proſecution for the ſame offence: but, on the contrary, if he made his peace with the king, ſtill he might be proſecuted at the ſuit of the party. And ſo, in England, if a man be acquitted on an indictment of murder, or found guilty, and pardoned by the king, ſtill he ought not (in ſtrictneſs) to go at large, but be impriſoned or let to bail till the year and day be paſt, by virtue of the ſtatute 3 Hen. VIII. c. 2. in order to be forthcoming to anſwer any appeal for the ſame felony, not having as yet been puniſhed for it: though, if he hath been found guilty of manſlaughter on an indictment, and hath had the benefit of clergy, and ſuffered the judgement of the law, he cannot afterwards be appealed; for it is a maxim in law, "that *nemo bis puniter pro eodem delicto.*" Before this ſtatute was made, it was not uſual to indict a man for homicide within the time limited for appeals; which produced very great inconvenience. If the appellee be acquitted, the appellor (by virtue of the ſtatute of Weſtm. 2. 13. Edw. I. c. 12.) ſhall ſuffer one years impriſonment, and pay a fine to the king, beſides reſtitution of damages to the party for the impriſonment and infamy which he has ſuſtained: and, if the appellor be incapable to make reſtitution, his abettors ſhall do it for him, and alſo be liable to impriſonment. This proviſion, as was foreſeen by the author of Fleta, proved a great diſcouragement to appeals; ſo that thenceforward they ceaſed to be in common uſe. If the appellee be found guilty, he ſhall ſuffer the ſame judgement, as if he had been convicted by indictment: but with this remarkable difference, that on an indictment, which is at the ſuit of the king, the king may pardon and remit the execution; on an appeal, which is at the ſuit of a private ſubject, to make an atonement for the private wrong, the king can no more pardon it, than he can remit the damages recovered on an action of battery. In like manner as, while the weregild continued to be paid as a fine for homicide, it could not be remitted by the king's authority. And the ancient uſage was, ſo late as Henry IV's time, that all the relations of the ſlain ſhould drag the appellee to the place of execution: a cuſtom, founded upon that ſavage ſpirit of family reſentment which prevailed univerſally through Europe after the irruption of the northern nations, and is peculiarly attended to in their ſeveral codes of law; and which ſtill prevails among the wild and untutored inhabitants of America: as if the finger of nature had pointed it out to mankind, in their rude and uncultivated ſtate. However, the puniſhment of the offender may be remitted and diſcharged by the concurrence of all parties intereſted; and as the king by his pardon may fruſtrate an indictment, ſo the appellant by his releaſe may diſcharge an appeal: *nam quilibet poteſt renunciare juri pro ſe introducto.*"

* *To* APPEAL *v. n.* [*appello*, Lat.] 1. To tranſfer a cauſe from one to another; with the particles *to* and *from*.—*From* the ordinary therefore they *appeal to* themſelves. *Hooker.* 2. To refer to another as judge.—Force, or a declared ſign of force, upon the perſon of another, where there is no common ſuperior on earth to *appeal to* for relief, is the ſtate of war; and it is the want of ſuch an appeal gives a man the right of war, even againſt an aggreſſor, though he be in a ſociety and a fellow-ſubject. *Locke.*—

They knew no foe, but in the open field,
And *to* their cauſe and *to* the gods *appeal'd*.
Stepney.

3. To call another as witneſs.—Whether this, that the ſoul always thinks, be a ſelf-evident propoſition, I *appeal to* mankind. *Locke.* 4. To charge with a crime; to accuſe: a term of law.—

One but flatters us,
As well appeareth by the cauſe you come,
Namely, t' *appeal* each other of high treaſon.'
Shakeſpeare.

* APPEALANT. *n. ſ.* [from *appeal.*] He that appeals.—

Lords *appealants*,
Your diff'rences ſhall all reſt under gage,
Till we aſſign you to your days of trial. *Shakſp.*

* APPEALER. *n. ſ.* [from *appeal.*] One who makes an appeal.

* *To* APPEAR. *v. n.* [*appareo*, Lat.] 1. To be in ſight; to be viſible.—As the leproſy *appeareth* in the ſkin of the fleſh. *Lev.* xiii. 45.—

And half her knee, and half her breaſt *appear*,
By art, like negligence, diſclos'd and bare.
Prior.

2. To become viſible as a ſpirit.—For I have *appeared* unto thee for this purpoſe, to make thee a miniſter and a witneſs. *Acts*, xxvi. 16. 3. To ſtand in the preſence of another; generally uſed of ſtanding before ſome ſuperiour.—When ſhall I come and *appear* before God? *Pſalm* xlii. 2. 4. To be the object of obſervation.—Let thy work *appear* unto thy ſervants, and thy glory unto their children. *Pſalm* xc. 16. 5. To exhibit one's ſelf before a court of juſtice.—

Keep comfort to you, and this morning ſee
You do *appear* before them. *Shakeſ. Hen.* VIII.

6. To be made clear by evidence.—Egfrid did utterly waſte and ſubdue it, as *appears* out of Beda's complaint againſt him; and Edgar brought it under his obedience, as *appears* by an ancient record. *Spenſer's Ireland.* 7. To ſeem in oppoſition to reality.—His firſt and principal care being to *appear* unto his people, ſuch as he would have them be, and to be ſuch as he *appeared*. *Sidney.*—

My noble maſter will *appear*
Such as he is, full of regard and honour. *Shakeſ.*

8. To be plain beyond diſpute.—From experiments, uſeful indications may be taken, as will *appear* by what follows. *Arbuthnot.*

(1.) * APPEARANCE. *n. ſ.* [from *To appear.*] 1. The act of coming into ſight; as, they were ſurpriſed by the ſudden *appearance* of the enemy. 2. The thing ſeen: as, the remarkable *appearances* in the ſky. 3. Phænomena; that quality of any thing which is viſible.—The advancing day of experimental knowledge diſcloſeth ſuch *appearances*, as will not lie in any model extant. *Glanvill's Sceptis.* 4. Semblance; not reality.—He encreaſed in eſtimation, whether by deſtiny, or whether by his virtues, or at leaſt by his *appearances* of virtues. *Hayward.*—

Heroic virtue did his actions guide,
And he the ſubſtance not th' *appearance* choſe.
Dryden.

—The hypocrite would not put on the *appearance* of virtue, if it was not the moſt proper means to gain love. *Addiſon.* 5. Outſide; ſhow.—Under a fair and beautiful *appearance* there ſhould ever be the real appearance of good. *Rogers.* 6. Entry into a place or company.—Do the ſame juſtice to one another, which ſhall be done us hereafter by thoſe, who ſhall make their *appearance* in the world, when this generation is no more. *Addiſon.* 7. Apparition; ſupernatural viſibility.—I think a perſon terrified with the imagination of ſpectres, more reaſonable than one who thinks the *appearance* of ſpirits fabulous. *Addiſon.* 8. Exhibition of the perſon to a court.—

I will not tarry; no, nor ever more
Upon this buſineſs my *appearance* make
In any of their courts. *Shakeſ. Hen.* VIII.

9. Open circumſtance of a caſe.—

Or grant her paſſion be ſincere,
How ſhall his innocence be clear?
Appearances were all ſo ſtrong,
The world muſt think him in the wrong. *Swift.*

10. Preſence; mein.—Health, wealth, victory, and honour, are introduced; wiſdom enters the laſt, and ſo captivates with her *appearance*, that he gives himſelf up to her. *Addiſon.* 11. Probability; ſeeming; likelihood.—There is that which hath no *appearance*, that this prieſt being utterly unacquainted with the true perſon, according to whoſe pattern he ſhould ſhape his counterfeit, ſhould think it poſſible for him to inſtruct his player. *Bacon.*

(2.) APPEARANCE, in law, ſignifies a defendant's filing a common or ſpecial bail, on any proceſs iſſued out of a court of judicature.

(3.) APPEARANCE, in perſpective, the repreſentation or projection of a figure, body, or like object, upon the perſpective plane.

(4.) APPEARANCE DIRECT, in optics, the view or ſight of any object by diſtinct rays; without either refraction or reflection.

(5.) APPEARANCES, in aſtronomy, &c. are more uſually called *phenomena* and *phaſes*.

(6.) APPEARANCES, in phyſiology. See PHASMATA.

(7.) APPEARANCES, TO SAVE, to diſcharge one's duty ſeemingly, or acquit one's ſelf of the formalites and externals thereof; ſo as to ſave character, and avoid giving offence.

* APPEARER. *n. ſ.* [from *To appear.*] The perſon that appears.—That owls and ravens are ominous *appearers*, and preſignify unlucky events, was an augurial conception. *Brown.*

* APPEASABLE. *adj.* [from *To appeaſe.*] That may be pacified; reconcileable.

* APPEASABLENESS. *n. ſ.* [from *To appeaſe.*] The quality of being eaſily appeaſed; reconcileableneſs.

* *To* APPEASE. *v. a.* [*appaiſer*, Fr.] 1. To quiet; to put in a ſtate of peace.—By his counſel he *appeaſeth* the deep, and planteth iſlands therein. *Eccluſ.* xliii. 23.—England had no leiſure to think of reformation, till the civil wars were *appeaſed*, and peace ſettled. *Davies on Ireland.* 2. To pacify; to reconcile; to ſtill wrath.—So Simon was *appeaſed* towards them, and fought no more againſt them. 1 *Mac.* xiii. 47.—

O God! if my deep prayers cannot *appeaſe* thee,
Yet execute thy wrath on me alone. *Shak.*
The reſt ſhall hear me call, and oft be warn'd
Their ſinful ſtate, and to *appeaſe* betimes
Th' incenſed Deity. *Milton.*

3. To ſtill; to quiet.—

The reſt
They cut in legs and fillets for the feaſt,
Which drawn and ſerv'd, their hunger they *appeaſe*. *Dryden.*

* APPEASEMENT. *n. ſ.* [from *To appeaſe.*] A ſtate of peace.—Being neither in numbers nor in courage great, partly by authority, partly by entreaty, they were reduced to ſome good *appeaſements*. *Hayward.*

* APPEASER. *n. f.* [from *To appeafe.*] He that pacifies others; he that quiets diſturbances.

APPEASING REMEDIES, in medicine, are thoſe which aſſuage the pain in a diſeaſe, and give the patient ſome reſt, and at the ſame time contribute to the cure. Theſe amount to the ſame with what we otherwiſe call anodynes, &c.

(1.) * APPELLANT. *n. f.* [*appello*, Lat. to call.] 1. A challenger; one that ſummons another to anſwer either in the liſts or in a court of juſtice —

This is the day appointed for the combat,
And ready are th' *appellant* and defendant,
Th' armourer and his man, to enter the liſts.
Shak.

Theſe ſhifts refuted, anſwer thy *appellant*,
Though by his blindneſs maim'd for high attempts,
Who now defies thee thrice to ſingle fight. *Milt.*

2. One that appeals from a lower to a higher power.—An appeal transfers the cognizance of the cauſe to the ſuperior judge; ſo that, pending the appeal, nothing can be attempted in prejudice of the *appellant*. *Ayliffe's Parergon.*

(2.) APPELLANTS, in church hiſtory, thoſe among the French clergy, who refuſed to ſubſcribe the bull *unigenitus*, iſſued by Clement XI. in 1713, and appealed from it, either to the pope better informed, or to a general council. The French biſhops, prieſts, monks, and even nuns, were divided into appellants, and non-appellants. The Janſeniſts and their followers were generally appellants.

* APPELLATE. *n. f.* [*appellatus*, Lat.] The perſon appealed againſt.—An appellatory libel ought to contain the name of the party appellant; the name of him from whoſe ſentence it is appealed; the name of him to whom it is appealed; from what ſentence it is appealed; the day of the ſentence pronounced, and appeal interpoſed; and the name of the party *appeliate*, or perſon againſt whom the appeal is lodged. *Ayliffe's Parergon.*

* APPELLATION. *n. f.* [*appellatio*, Lat.] Name; word by which any thing is called.—Nor are always the ſame plants delivered under the ſame name and *appellations*. *Brown.*—Good and evil commonly operate upon the mind of man, by reſpective names or *appellations*, by which they are notified and conveyed to the mind. *South.*

(1.) APPELLATIONS RIDICULOUSLY CORRUPTED. Nothing can be more foreign to the original meaning of many words and proper names, than their preſent appellations, frequently owing to the hiſtory of thoſe things being forgotten, or an ignorance of the language in which they were expreſſed. Who, for inſtance, would ſuppoſe that the head on the French coaſt, near Calais, called by our ſeamen *Blackneſs*, could be ſo entitled from its French name of *Blanc Nez*, or, the *White* Head-land? Henry VIII. having taken the town of Bullogne in France, the gates of which he brought to Hardes in Kent, where they are ſtill remaining, the flatterers of that reign highly magnified this action, which like Porto-Bello, became a popular ſubject for ſigns: and the port or harbour of Bullogne, called *Bullogne Mouth*, was accordingly ſet up at a noted inn in Holburn; the name of the inn long out-living the ſign and fame of the conqueſt, an ignorant painter employed by a no leſs ignorant landlord, to paint a new one, repreſented it by a bull and a large gaping human mouth (anſwering to the vulgar pronunciation of *Bull and Mouth.*) The ſame piece of hiſtory gave being to the *bull and gate*, originally meant for Bullogne gate, and repreſented by an embattled gate or entrance into a fortified town. The *barber's pole* has been the ſubject of many conjectures; ſome conceiving it to have originated from the word *poll* or head, with ſeveral other conceits as far-fetched and as unmeaning: but the true intention of that party-coloured ſtaff was to ſhow that the maſter of the ſhop practiſed ſurgery, and could breathe a vein as well as mow a beard; ſuch a ſtaff being to this day, by every village practitioner, put into the hand of a patient undergoing the operation of phlebotomy. The white band which encompaſſes the ſtaff, was meant to repreſent the fillet, thus elegantly twined about it. Nor were the *Chequers* (at this time a common ſign of a public-houſe) leſs expreſſive, being the repreſentation of a kind of draught-board called *tables*, and ſhowed that there that game might be played. From their colour which was red, and the ſimiliarity to a lattice, it was corruptly called the *red lattice*, which word is frequently uſed by ancient writers to ſignify an alehouſe. The Spectator has explained the ſign of the *Bell Savage inn*, plauſibly enough, in ſuppoſing it to have been originally the figure of a beautiful female found in the woods, called in French *la belle ſauvage*. But another reaſon has ſince been aſſigned for that appellation, namely, that the inn was once the property of Lady Arabella Savage, and familiarly called Bell Savage's inn, probably repreſented, by a bell and a ſavage or wild man, which was a rebus for her name; rebuſſes being much in faſhion in the 16th century. The *three blue balls* prefixed to the doors and windows of pawn brokers ſhops, by the vulgar humoroufly enough ſaid to indicate that it is two to one that the things pledged are ever redeemed, were in reality the arms of a ſet of merchants from Lombardy, who were the firſt that publicly lent money on pledges. They dwelt together in a ſtreet, from them named Lombard-ſtreet, in London, and they alſo gave their name to another at Paris. The appellation of Lombard was formerly all over Europe conſidered as ſynonymous to that of uſurer. At the inſtitution of yeomen of the guards, they uſed to wait at table on all great ſolemnities, and were ranged near the buffets; this procured them the name of *buffetiers*, not very unlike in ſound to the jocular appellation of *beef-eaters*, now given them; though probably it was rather the voluntary miſnomer of ſome wicked wit, than an accidental corruption ariſing from ignorance of the French language. The opprobrious title of *bum-bayliffe*, ſo conſtantly beſtowed on the ſheriff's officers, is, according to Judge Blackſtone, only the corruption of *bound bayliffe*, every ſheriff's officer being obliged to enter into bonds and to give ſecurity for his good behaviour, previous to his appointment. A *cordwainer* ſeems to have no relation to the occupation it is meant to expreſs, which is that of a ſhoemaker. But *cordonier*, originally ſpelt *cordaunier*, is

is the French word for that trade; the beſt leather uſed for ſhoes coming originally from Cordua in Spain. Spaniſh leather ſhoes were once famous in England. Of a piece with theſe corrupted appellations, is that of the uſual proclamation of "*O yes, O yes!*" in our courts of law, commanding ſilence; which is a corruption of the French word *Oyez*, *Liſten*, and has been retained ever ſince the pleadings were held in that language.

(1.) * APPELLATIVE. *n. ſ.* [*appellativum*, Lat.] Words and names are either common or proper. Common names are ſuch as ſtand for univerſal ideas, or a whole rank of beings, whether general or ſpecial. Theſe are called *appellatives*. So fiſh, bird, man, city, river, are common names; and ſo are trout, eel, lobſter; for they all agree to many individuals, and ſome to many ſpecies. *Watt's Logick.*

(2.) APPELLATIVE NAMES. See N° 1. and NAME.

*. APPELLATIVELY. *adv.* [from *appellative.*] According to the manner of nouns appellative; as, *this man is a Hercules. Hercules* is uſed *appellatively* to ſignify *a ſtrong man.*

* APPELLATORY. *adj.* [from *appeal.*] That which contains an appeal. See APPELLATE.

(1.) * APPELLEE. *n. ſ.* [from *appeal.*] One who is appealed againſt, and accuſed. *Dict.*

(2.) APPELLEE, in the civil law properly belongs only to the judge before whom the appeal is brought.

APPELLOUR. See APPELLANT, N° 1.

APPENAGE. See APANAGE.

* *To* APPEND. *v. a.* [*appendo*, Lat. to hang to any thing.] 1. To hang any thing upon another; as, the inſcription was *appended* to the column: the ſeal is *appended* to the record. 2. To add to ſomething as an acceſſory, not a principal part.

* APPENDAGE. *n. ſ.* [French.] Something added to another thing, without being neceſſary to its eſſence, as a portico to the houſe—Modeſty is the *appendage* of ſobriety, and is to chaſtity, to temperance, and to humility, as the fringes are to a garment. *Taylor.*—None of the laws of motion now eſtabliſhed will ſerve to account for the production, motion, or number of bodies, nor their *appendages*, though they may help us a little to conceive their appearances. *Cheyne.*

(1.) * APPENDANT. *adj.* [French.] 1. Hanging to ſomething elſe. 2. Belonging to; annexed: concomitant. *Taylor.*—Riches multiplied beyond the proportion of our character, and the wants *appendant* to it, naturally diſpoſe men to forget God. *Rogers.* 3. In law.—*Appendant* is any thing belonging to another, as *acceſſorium principali*, with the civilians; or, *adjunctum ſubjecto*, with the logicians. An hoſpital may be *appendant* to a manour; a common of fiſhing *a pendant* to a freehold. *Cowel.*

(2.) APPENDANT ADVOWSON. See ADVOWSON.

(3.) APPENDANT COMMON. See COMMON.

(4.) * APPENDANT *n. ſ.* That which belongs to another thing, as an accidental or adventitious part.—A word, a look, a tread, will ſtrike, as they are *appendants* to external ſymmetry, or indications of the beauty of the mind. *Grew.*

APPENDED REMEDIES. See APPENSA.

* *To* APPENDICATE. *v. a.* [*appendo*, Lat.] To add to another thing.—In a palace there is the caſe or fabrick of the ſtructure, and there are certain additaments; as, various furniture, and curious motions of divers things *appendicated* to it. *Hale.*

* APPENDICATION. *n. ſ.* [from *appendicate.*] Adjunct; appendage; annexion.—There are conſiderable parts and integrals, and *appendications* unto the *mundus aſpectabilis*, impoſſible to be eternal. *Hale.*

APPENDICES EPIPLOICÆ. See ANATOMY, INDEX.

APPENDICULÆ ASTERIARUM, wires of aſteriæ, a name given by the writers on natural hiſtory, to certain ſmall branches which are placed in a circular order at different diſtances upon the column of the aſteriæ.

APPENDICULA VERMIFORMIS. See ANATOMY, § 291.

APPENDITIA, the appendages of an eſtate.

(1.) * APPENDIX. *n ſ.* [*appendices*, plur. Lat.] 1. Something appended, or added to another thing.—The cherubim were never intended as an object of worſhip, becauſe they were only the *appendices* to another thing But a thing is then propoſed as an object of worſhip, when it is ſet up by itſelf, and not by way of addition or ornament to another thing. *Stilling fleet.*—Normandy became an *appendix* to England, the nobler dominion, and received a greater conformity of their laws to the Engliſh, than they gave to it. *Hale.* 2. An adjunct or concomitant.—All concurrent *appendices* of the action ought to be ſurveyed, in order to pronounce with truth concerning it. *Watts.*

(2.) APPENDIX, in anatomy. See ANATOMY, § 273, 291.

(3.) APPENDIX, in literature, a treatiſe or ſupplement added at the end of a work, to render it more complete.

APPENINES, a chain of mountains, which divide Italy through its whole length. See APENNINUS.

APPENSA, or APPENDED REMEDIES, ſuch as are outwardly applied, by hanging about the neck. The word comes from *ad* and *pendo*, I hang to. Such are amulets, necklaces, phylacteries, &c.

APPENSURE, *n. ſ.* In old records, the payment of money by weight.

APPERCEPTION, or APPERCEPTION, a term uſed by Leibnitz and his followers for conſciouſneſs.

APPERSHOVEN, a village of Germany, in Suabia, on the Kyffel. Lon. 8. 50. E. Lat. 31. 50. N.

* *To* APPERTAIN. *v. n.* [*appartenir*, Fr.] 1. To belong to as of right: with *to*.—The honour of deviſing this doctrine, that religion ought to be inforced by the ſword, would be found *appertaining to* Mahomed the falſe prophet. *Raleigh.* 2. To belong to by nature or appointment.—If the ſoul of man did ſerve only to give him being in this life, then things *appertaining to* this life would content him, as we ſee they do other creatures. *Hooker.*—And they roaſted the paſſover with fire, as *appertaineth*: as for the ſacrifices they ſod them in braſs pots. 1 *Eſdras.*

* APPERTAINMENT. *n. ſ.* [from *appertain.*] That which belongs to any rank or dignity.—He

He ſent out meſſengers, and we lay by
Our *appertainments*, viſiting of him. *Shakeſp.*

* APPERTENANCE. *n. ſ.* [*appertenance*, Fr.] That which belongs or relates to another thing.—Can they which behold the controverſy of divinity condemn our enquiries in the doubtful *appertenancies* of arts, and receptaries of philoſophy? *Brown.*

APPERTINANCES. See APPURTENANCES.

* APPERTINENT. *adj.* [from *To appertain.*] Belonging; relating.—

You know how apt our love was to accord
To furniſh him with all *appertinents*
Belonging to his honour. *Shakeſp. Henry V.*

* APPETENCE. } *n. ſ. appetentia*, Lat.] Car-
* APPETENCY. } nal deſire; ſenſual deſire.—

Bred only and completed to the taſte
Of luſtful *appetence*; to ſing, to dance,
To dreſs, to troule the tongue, and roll the eye. *Milton.*

* APPETIBILITY. *n. ſ.* [from *appetible.*] The quality of being deſirable.—That elicitation which the ſchools intend is a deducing of the power of the will into act, merely from the *appetibility* of the object, as a man draws a child after him with the ſight of a green bough. *Bramhall againſt Hobbes.*

* APPETIBLE. *adj.* [*appetibilis*, Lat.] Deſirable; that which may be the object of appetite.—Power both to ſlight the moſt *appetible* objects, and to controul the moſt unruly paſſions. *Bramhall againſt Hobbes.*

(1.) * APPETITE. *n. ſ.* [*appetitus*, Lat.] 1. The natural deſire of good; the inſtinct by which we are led to ſeek pleaſure.—The will, properly and ſtrictly taken, as it is of things which are referred unto the end that men deſireth, differeth greatly from that inferior natural deſire, which we call *appetite*. The object of *appetite* is whatſoever ſenſible good may be wiſhed for; the object of will is that good which reaſon does lead us to ſeek. *Hooker.* 2. The deſire of ſenſual pleaſure.

Why, ſhe would hang on him,
As if increaſe of *appetite* had grown
By what it fed on. *Shakeſp. Hamlet.*

3. Violent longing; eagerneſs after any thing.—No man could enjoy his life, his wife, or goods, if a mightier man had an *appetite* to take the ſame from him. *Davies.*—Hopton had an extraordinary *appetite* to engage Waller in a battle. *Clarendon.* 4. The thing eagerly deſired.—Power being the natural *appetite* of princes, a limited monarch cannot gratify it. *Swift.* 5. Keenneſs of ſtomach; hunger; deſire of food.—There be four principal cauſes of *appetite*; the refrigeration of the ſtomach, joined with ſome dryneſs; contraction; vellication, and abſterſion; beſides hunger, which is an emptineſs. *Bacon.* 6. It has ſometimes *of* before the object of deſire.—The new officer's nature needed ſome reſtraint to his immoderate *appetite of* power. *Clarend.* 7. Sometimes *to*.—We have generally ſuch an *appetite to* praiſe, that we greedily ſuck it in. *Government of the Tongue.*

(2.) APPETITE, [from *ad*, to, and *peto*, to crave,] in medicine, is uſed to denote a natural periodical deſire to eat and drink, in order to repair what had been waſted by the excretions of the body. A loſs of appetite is called anorexia. A prepoſterous appetite for things not proper for food is called *pica*. An immoderate appetite is called *bulimia*, or *fames canina*. Some, however, diſtinguiſh the *βυλιμια*, and canine appetite; making it the diſtinguiſhing character of the latter, that it is attended with a lientry, or other cœliacal flux. See § 4 and 5.

(3.) APPETITE, in philoſophy, a deſire of enjoying ſomething wanted; or a complacency in the fruition of a thing preſent. Some philoſophers define appetite, an inclination of the ſoul towards ſome object conſidered as good; or a propenſity to an object in reſpect of the good that is apprehended in it. Others diſtinguiſh it into voluntary and natural. The firſt is the will itſelf, acting under a competent knowledge of what is wanted: the ſecond is a kind of inſtinct, whereby we are mechanically driven to conſult our own preſervation. Others again divide it into SENSITIVE and RATIONAL; ſee § 6 and 7. Appetite is reſtrained, by Hutcheſon, to ſuch of our deſires as have a previous painful and uneaſy ſenſation, antecedently to any opinion of good in the object; nay, ſo as that the object is often chiefly eſteemed good only for its allaying this painful uneaſineſs, or if it alſo give a poſitive pleaſure, yet the uneaſy ſenſation is previous to, and independent of this opinion of good in it.

(4.) APPETITE, DEFECTIVE. The defect of appetite is of two kinds, and is uſually divided, by medical writers, into ANOREXIA and NAULES, which ſee.

(5.) APPETITE, EXCESSIVE. See BULMIA, and OREXIS.

(6.) APPETITE, RATIONAL, is that which ariſes from an apprehenſion of good in the object, as conceived by the underſtanding, guided by reaſon, and proportioned to the value of the object.

(7.) APPETITE, SENSITIVE, is that which ariſes from a notion of goodneſs in the object, as impreſſed by the impulſe of the ſenſes, by a blind propenſity, without any determinate ideas of the real goodneſs of the qualities for which we deſire it.

(8.) APPETITES, DISTINGUISHED FROM PASSIONS. Appetites are paſſions directed to general objects, in contradiſtinction to paſſions directed to particular objects, which retain their proper name. Thus we ſay, an *appetite* for fame, for glory, for conqueſt, for riches; but we ſay the *paſſion* of love, of hatred, &c. Appetite may alſo be diſtinguiſhed from paſſion, ſince the latter has no exiſtence till a proper object be preſented; whereas the former exiſts firſt, and then is directed to an object.

* APPETITION. *n. ſ.* [*appetitio*, Lat.] Deſire.—The actual *appetition* or faſtening our affections on him. *Hammond's Practical Catechiſm.*—We find in animals an eſtimative or judicial faculty, an *appetition* or averſation. *Judge Hale.*

* APPETITIVE. *adj.* [from *appetite.*] That which deſires; that which has the quality of deſiring.—The will is not a bare *appetitive* power as that of the ſenſual appetite, but is a rational appetite. *Hale's Origin of Mankind.*—I find in myſelf an *appetitive* faculty always in exerciſe, in the very height of activity and invigoration. *Norris.*

APPETITUS CANINUS, a ravenous appetite, like that of a dog.

APPIADES, in mythology, five divinities fo called becauſe their temples were at Rome near the fountains of Appius, viz. Venus, Pallas, Veſta, Concord, and Peace.

APPIAN, an eminent writer of the Roman hiſtory in Greek, under the reign of Trajan and Adrian. He was a native of Alexandria in Egypt; whence he went to Rome, and diſtinguiſhed himſelf ſo well as an advocate, that he was choſen one of the procurators of the empire, and the government of a province was committed to him. He did not complete the Roman hiſtory in a continued ſeries; but wrote diſtinct hiſtories of all nations that had been conquered by the Romans, in which he placed every thing relating to thoſe nations in the proper order of time. His ſtyle is plain and ſimple: in the opinion of Photius, he has ſhown the greateſt knowledge of military affairs, and the happieſt talent at deſcribing them of any of the hiſtorians; for while we read his work, we in a manner ſee the battles he deſcribes. Of all this voluminous work there remains only what treats of the Punic, Syrian, Parthian, Mithridatic, and Spaniſh wars, with thoſe againſt Hannibal, the civil wars, and the wars in Illyricum, and ſome fragments of the Celtic or Gallic wars.

APPIAN WAY, } a road that reached from Rome
APPIA VIA, } through Capua to Brunduſium between 330 and 350 miles long. Appius Claudius, Cæcus, the Cenſor, in the year of the city 441, carried it from the Porta Capena to Capua; Julius Cæſar from Capua to Benevento; and Auguſtus thence to Brunduſium. It was laid with very hard ſtone, brought from a great diſtance, large and ſquared; and it was ſo wide, that ſeveral waggons could go abreaſt, being above 15 feet broad. Statius calls it *the queen of roads*. Its courſe is deſcribed by Horace, Strabo, and Antonine. Caius Gracchus placed ſtones alongſt it, called *cippi* and *termini*, to mark the miles, afford foot paſſengers reſting ſeats, and enable equeſtrian travellers to mount, there being then no ſtirrups uſed. Great part of this road ſtill remains entire.

APPII FORUM, a town on the SW. of Italy, about 50 miles S. of Rome, and 18 from the Three Taverns; where the Chriſtians of Rome came to meet Paul in his journey from Puteoli, to that metropolis of the world.

APPIN, a pariſh of Scotland, in Argyleſhire, united to that of Liſmore, the two together forming an extent of no leſs than 63 miles in length, by 10 and in ſome places 16 miles in breadth. The ſoil of Appin is equally ſuited to corn and graſs; but the greateſt part of the country being mountainous, it is beſt adapted for ſheep, of which there are 25,000 in the pariſh. Many of the ſheep farms are very extenſive; and one of them is 18 miles long. The climate, though moiſt, is healthy and remarkable for the longevity of its inhabitants. Mr M'Nicol, the miniſter, in his Statiſtical report to Sir John Sinclair, ſays, that "many live to the ages of from 84 to 96, and even to 100 years; that one man died in 1790, aged 105," and that "in 1744, he ſaw a woman, who was 116!" The population of Appin, in 1791, was 2405. The roads and bridges are good. The maſſacre of Glenco, happened in this pariſh. See GLENCO and LISMORE.

APPIUS CLAUDIUS. See CLAUDIUS.

* *To* APPLAUD. *v. a.* [*applaudo*, Lat.] 1. To praiſe by clapping the hand.—

I would *applaud* thee to the very echo,
That ſhould *applaud* again. *Shakeſp. Macbeth.*

2. To praiſe in general.—

Nations unborn your mighty names ſhall ſound,
And worlds *applaud* that muſt not yet be found!
Pope.

* APPLAUDER. *n. ſ.* [from *applauſe*.] He that praiſes or commends.—I had the voice of my ſingle reaſon againſt it, drowned in the noiſe of a multitude of *applauders*. *Glanville's Sceptis.*

(1.) * APPLAUSE. *n. ſ.* [*applauſus*, Lat.] Approbation loudly expreſſed; praiſe: properly a clap.—

This general *applauſe* and chearful ſhout,
Argues your wiſdom and your love to Richard.
Shakeſp.

See their wide ſtreaming wounds; they neither came
For pride of empire, nor deſire of fame;
Kings fight for kingdoms, madmen for *applauſe*,
But love for love alone, that crowns the lovers cauſe. *Dryden's Fables.*

(2.) APPLAUSE, in antiquity, differed from acclamation as the latter was articulate and performed with the voice, the former with the hands.—Among the Romans, applauſe was an artificial muſical kind of noiſe, made by the audience or ſpectators to expreſs their ſatisfaction. There were three ſpecies of applauſe, denominated from the different noiſes made in them, viz. *Bombus*, *Imbrices*, and *Teſtæ*; the firſt a confuſed din, made either by the hands or the mouth; the ſecond and third, by beating on a ſort of ſounding veſſels placed in the theatres for this purpoſe.—Perſons were inſtructed to give applauſe with ſkill; and there were even maſters who profeſſed to teach the art. The proficients in this way let themſelves out for hire to the vain-glorious among the poets, actors, &c. and were properly diſpoſed to ſupport a loud applauſe. Theſe they called *Laudicæni*, and Σοφοκλεις. At the end of the play, a loud peal of applauſe was expected, and even aſked of the audience, either by the chorus or the perſon who ſpoke laſt. The formula was, *Spectatores plaudite*, or *Valete et plaudite*. The *plauſores*, or applauders, were divided into chori, and diſpoſed in theatres oppoſite to each other like the choriſters in cathedrals, ſo that there was a kind of concert of applauſes.

(1.) * APPLE. *n. ſ.* [*æppel*, Saxon.] 1. The fruit of the apple tree.—

Tall thriving trees confeſs'd the fruitful mold;
The red'ning *apple* ripens here to gold. *Pope.*

2. The pupil of the eye.—He inſtructed him; he kept him as the *apple* of his eye. *Deut.* xxxii. 10.

(2.) APPLE, the fruit of the pyrus malus. See PYRUS.

APPLE, ADAM'S. See ADAMI POMUM, ANATOMY, § 355, and CITRUS.

APPLE, BITTER. See COLOCYNTHIS.

(1.) APPLEBY, or APULBY, anciently ABALLABA, a town in the county of Weſtmoreland, pleaſantly ſituated on the Eden, and almoſt ſurrounded by it. It was a Roman ſtation in the time of Aurelian, and is ſituated on the Roman military

military road, which croſſes the county from Stainmore to Cumberland. It is the only borough in Weſtmoreland, and ſends two members to parliament. It has 4 fairs; on Whitſun Eve, Whitſun Monday, 10, June, and 10 Auguſt, with a market every Saturday. From the old Engliſh ſtatutes it appears that parliaments were formerly held in it. It was once a very conſiderable town, and had great privileges; but it is long ago gone to decay, and now only conſiſts of mean houſes in one broad ſtreet, which runs with an eaſy aſcent from N. to S. and at the head of which is the caſtle. It has two churches; a town-hall in which the aſſizes are held; a county-jail; and an hoſpital for a governeſs and 12 widows, founded in 1651 by a daughter of Lord Clifford. It is governed by a mayor, 12 aldermen, a common council, and 2 ſerjeants at mace, &c. and is ſaid to have the beſt corn market in theſe northern parts. It lies 10 miles SE. of Penrith, and 266 NNW. of London. Lon. 2. 34. W. Lat. 54. 34. N.

(2—6.) APPLEBY, the name of other five ſmall towns or villages in England; viz. 2. one in Derby-ſhire between Burton upon Trent and Aſhby de-la-Zouch: 3. another near Hertford: 4. APPLEBY MAGNA, and 5. APPLEBY PARVA, in Leiceſterſhire, near Normantown: and 6. one in Lincolnſhire, between Glanford bridge and Burton upon Trent.

(1.) APPLECROSS, a pariſh of Scotland in Roſs-ſhire, which derives its name from an ancient proprietor, in memory of whom five apple trees were planted croſs-wiſe, and have ever ſince been perpetuated by his ſucceſſors. It was formerly called *Comrick*. It extends about 20 miles along the coaſt in a direct line; but reckoning all the curves and windings of the ſhore cannot be under 90 miles long. It is mountainous and rocky, but the valleys are fertile, and produce oats, barley, potatoes, &c. There are about 3000 black cattle in the pariſh, beſides ſheep and goats; and many wild animals, ſuch as deer, roes, badgers, otters, foxes, &c. A flock of 40 or 50 deer are often ſeen together on the hills. There is a copper mine in it, reckoned, by Mr Williams, as rich as any in the kingdom. It exports black cattle, butter, cheeſe, fiſh, and kelp. Mr M'Queen, the miniſter, in his Statiſtical report to Sir J. Sinclair, ſtates the population, in 1792, at 1734 ſouls, which is nearly double the number in 1755, notwithſtanding emigrations. Mr M'Queen aſcribes the increaſe chiefly to two cauſes, the abolition of ſervitudes, and the cultivation of potatoes. Gaelic is the only language. The chief diſadvantage Applecroſs labours under is the want of ſalt.

(2.) APPLECROSS, a river, which runs through the pariſh ſo called. See N° 1.

APPLE, CUSTARD. See ANNONA.

APPLEDORE, 1. a ſmall port in Devonſhire, on the coaſt, the firſt harbour within the bar of Barnſtable; 2. a village in Kent, near Tenterden, on the Rother, 54 miles from London.

APPLEDORE-COMB, a village in Iſle of Wight.

APPLEDRUM, a ſmall town in Suſſex, between Chicheſter and Thorney Iſland.

APPLE FLY, in natural hiſtory, the name given by authors to a ſmall green fly found ſometimes within an apple, and hatched of a worm or maggot, very frequently found infeſting that fruit.

APPLEFORD, a village in Berkſhire.

(1.) APPLEGARTH, a foreſt in the N. Riding of Yorkſhire, near Richmond.

(2.) APPLEGARTH, } A pariſh of Scotland, in
APPLEGIRTH. } Dumfries-ſhire, ſeparated from thoſe of Johnſton and Lochmaben by the Annan, and from that of Dryſdale by the Dryfe; extending about 6 miles from S. to N. and from W. to E. about 5. It is ſituated about 11 miles from Dumfries, 12 from Annan, (its neareſt ſea ports) and 60 from Edinburgh and Glaſgow. The population, in 1792, as ſtated in Sir J. Sinclair's Statiſtical Account, was 741 ſouls; and it had decreaſed 156 within 37 years. The pariſh contains about 2000 ſheep, 1500 black cattle, and 150 horſes. It exports barley to Liverpool and oats to Greenock.

APPLE, GOLDEN, in ancient church ornaments, the globular part of the candleſtick. *Du Cange.*

* APPLE-GRAFT. *n. ſ.* [from *apple* and *graft*.] A twig of apple-tree grafted upon the ſtock of another tree.—We have ſeen three and twenty ſorts of *apple grafts* upon the ſame old plant, moſt of them adorned with fruit. *Boyle.*

APPLE JUICE. The juice of apples is a menſtruum for iron. A ſolution of iron in the juice of the apples, called *golden rennets*, evaporated to a thick conſiſtence, proves an elegant chalybeate, which keeps well.

APPLE, MAD. See MELONGENA.

APPLE, MALE BALSAM. See MOMORDICA.

APPLE, MARCHASITE, ſo called by Dr Grew, on account of its figure, as being round except on one ſide, where it falls in, and having a ſtalk like a young apple.

APPLE, OAK, an excreſcence or exudation of the juice of the oak, joined with a degree of putrefaction.

(1.) * APPLE OF LOVE.—*Apples of love* are of three ſorts; the moſt common having long trailing branches, with round leaves and yellow joints, ſucceeded by apples, as they are called, at the joints, not round, but bunched; of a pale orange ſhining pulp, and ſeeds within. *Mortimer.*

(2.) APPLE OF LOVE. See LYCOPERSICON.

APPLE OF THE EYE. A name not unfrequently given to the PUPIL. See ANATOMY, INDEX.

APPLE OF WAX. See POMUM DE CERA.

APPLE, PINE. See PINUS.

APPLESHAW, a village in Hampſhire, four miles from Andover. Fairs, May 23, and Nov. 5.

APPLE, SOAP. See SAPINDUS.

APPLE, STAR. See CHRYSOPHYLLUM.

* APPLE-TART. [from *apple* and *tart*.] A tart made of apples.—

What, up and down carv'd like an *apple-tart*!
Shakeſp.

APPLETHWAITE, a village in Weſtmoreland, near Winandermere Lake.

APPLETON, the name of 9 Engliſh villages; viz. 1. in Berkſhire, near Abingdon: 2. in Cheſhire, near Warrington; 3. in Lancaſhire, near Preſcot: 4. in Norfolk, N. of Flitcham: 5. EAST, and 6. WEST, in Yorkſhire, near Bedal: 7. in Yorkſhire, near Rydel: 8. in Yorkſhire, near Skipton: and 9. in Yorkſhire, near Tadcaſter.

APPLETON NUN, a ſmall town, between Selby and York.

* APPLE-TREE. *n. ſ.* [from *apple* and *tree.*] The fruit of this tree is for the moſt part hollowed about the foot ſtalk; the cells incloſing the ſeed are ſeparated by cartilaginous partitions; the juice of the fruit is ſowriſh, the tree large and ſpreading; the flowers conſiſt of five leaves, expanding in form of a roſe. There are a great variety of theſe fruits. Thoſe for the deſſert are, the white juniting, Margaret, apple, ſummer pearmain, ſummer queening, embroidered apple, golden reinette, ſummer white Colville, ſummer red Colville, ſilver pippin, aromatick pippin, the grey reinette, la haute-bonté, royal ruſſeting, Wheeler's ruſſet, Sharp's ruſſet, ſpice apple, golden pippin, nonpareil, and Papi. Thoſe for the kitchen uſe are, codling, ſummer, marigold, ſummer red pearmin, Holland pippin, Kentiſh pippin, the hanging body, Loan's pearmain, French reinette, French pippin, royal ruſſet, monſtruous reinette, winter pearmain, promme violette, Spencer's pippin, ſtone pippin, oaken pippin. And thoſe generally uſed for cyder are, Devonſhire royal wilding, redſtreaked apple, the Whitſour, Herfordſhire underleaf, John apple, &c. *Miller.*—Oaks and beeches laſt longer than *apples* and pears. *Bacon.*

APPLE-TREE-WICK, a village in Yorkſhire, near Skipton. It has a fair on Oct. 2.

* APPLE-WOMAN. *n. ſ.* [from *apple* and *woman.*] A woman that ſells apples, that keeps fruit on a ſtall.—Yonder are two *apple-women* ſcolding, and juſt ready to uncoif one another. *Arbuthnot and Pope.*

* APPLIABLE. *adj.* [from *apply.*] That which may be applied. For this word the moderns uſe *appliable;* which ſee.—Limitations all ſuch principles have, in regard of the varieties of the matter whereunto they are *appliable. Hooker.*—All that I have ſaid of the heathen idolatry is *appliable* to the idolatry of another ſort of men in the world. *South.*

* APPLIANCE. *n. ſ.* [from *apply.*] The act of applying; the thing applied.—

Diſeaſes deſp'rate grown,
By deſperate *appliance* are relieved. *Shakeſp.*

* APPLICABILITY. *n. ſ.* [from *applicable.*] The quality of being fit to be applied to ſomething.—The action of cold is compoſed of two parts; the one preſſing, the other penetration, which requires *applicability. Digby.*

* APPLICABLE. *adj.* [from *apply.*] That which may be applied, as properly relating to ſomething.—What he ſays of the portrait of any particular perſon, is *applicable* to poetry. In the character, there is a better or a worſe likeneſs; the better is a panegyrick, and the worſe a libel. *Dryden.*—It were happy for us, if this complaint were *applicable* only to the heathen world. *Rogers.*

* APPLICABLENESS. *n. ſ.* [from *applicable.*] Fitneſs to be applied.—The knowledge of ſalts may poſſibly, by that little part which we have already delivered of its *applicableneſs*, be of uſe in natural philoſophy. *Boyle.*

* APPLICABLY. *adv.* [from *applicable.*] In ſuch a manner as that it may be properly applied.

(1.) * APPLICATE. *n. ſ.* [from *apply.*] A right line drawn acroſs a curve, ſo as to biſect the diameter thereof. *Chambers.*

(2.) APPLICATE NUMBER. See CONCRETE.

(3.) APPLICATE ORDINATE, in geometry, a right line at right angles, applied, to the axis of any conic ſection and bounded by the curve.

(1.) * APPLICATION. *n. ſ.* [from *apply.*] 1. The act of applying any thing to another; as, he mitigated his pain by the *application* of emollients. 2. The thing applied; as, he invented a new *application*, by which blood might be ſtaunched. 3. The act of applying to any perſon, as a ſolicitor, or petitioner.—It ſhould ſeem very extraordinary, that a patent ſhould be paſſed, upon the *application* of a poor, private, obſcure mechanic. *Swift.* 4. The employment of means for a certain end.—There is no ſtint which can be ſet to the value or merit of the ſacrificed body of Chriſt; it hath no meaſured certainty of limits, bounds of efficacy unto life it knoweth none, but is alſo itſelf infinite in poſſibility of *application. Hooker.*—If a right courſe be taken with children, there will not be much need for the *application* of the common rewards and puniſhments. *Locke.* 5. Intenſeneſs of thought; cloſe ſtudy.—I have diſcovered no other way to keep our thoughts cloſe to their buſineſs, but by frequent attention and *application*, getting the habit of attention and *application. Locke.* 6. Attention to ſome particular affair: with the particle *to.*—His continued *application to* ſuch publick affairs, as may benefit his kingdoms, diverts him from his pleaſures. *Addiſon.* 7. Reference to ſome caſe or poſition; as the ſtory was told, and the hearers made the *application.*—This principle acts with the greateſt force in the worſt *application*; and the familiarity of wicked men more ſucceſsfully debauches, than that of good men reforms. *Rogers.*

(2.) APPLICATION, in aſtrology, the approach of two planets to each other.

(3.) APPLICATION, in geometry, is uſed either for diviſion, for applying one quantity to another, whoſe areas, but not figures, ſhall be the ſame; or, transferring a given line into a circle, or other figure, ſo that its ends ſhall be in the perimeter of the figure.

(4.) APPLICATION, in theology, is uſed, by ſome divines, for the act whereby our Saviour transfers to us, what he had earned or purchaſed by his holy life and death. By this application of the merits of Chriſt, we are to be juſtified, and intitled to grace and glory. Application, in the concluſion of Sermons, comprehends the improvement to be made by the congregation of what they have heard.

* APPLICATIVE. *adj.* [from *apply.*] That which applies.—The directive command for council is in the underſtanding, and the *applicative* command for putting in execution, is in the will. *Bramhall againſt Hobbes.*

(1.) * APPLICATORY. *adj.* [from *apply.*] That which comprehends the act of application.

(2.) * APPLICATORY. *n. ſ.* That which applies.—There are but two ways of applying the death of Chriſt: faith is the inward *applicatory*, and if there be any outward, it muſt be the ſacrament. *Taylor's Worthy Communicant.*

(1.) * To

(1.) * *To* APPLY. *v. a.* [*applico*, Lat.] 1. To put one thing to another.—

He ſaid, and to the ſword his throat applied. *Dryden.*

2. To lay medicaments upon a wound.—

Apply ſome ſpeedy cure, prevent our fate,
And ſuccour nature ere it be too late. *Addiſon.*

3. To make uſe of as relative or ſuitable to ſomething.—This brought the death of your father into remembrance, and I repeated the verſes which I formerly *applied* to him.—*Dryden's Fables.* 4. To put to a certain uſe.—The profits there might be *applied* towards the ſupport of the year. *Clarendon.* 5. To us as means to an end.—Theſe glorious beings are inſtruments in the hands of God, who *applies* their ſervices, and governs their actions, and diſpoſes even their wills and affections. *Rogers.* 6. To fix the mind upon; to ſtudy; with *to*. Locke uſes *about*, leſs properly.—*Apply* thine heart *unto* inſtruction, and thine ears *to* the words of knowledge. *Pro.* xxiii. 12.—Every man is conſcious to himſelf that he thinks; and that which his mind is *applied about*, whilſt thinking, is the ideas that are there. *Locke.*—It is a ſign of a capacious mind, when the mind *can apply* itſelf *to* ſeveral objects with a ſwift ſucceſſion. *Watts.* 7. To have recourſe to, as a ſolicitor or petitioner; with *to*: as, I *applied* myſelf *to* him for help. 8. To addreſs to.—

Sacred vows and myſtic ſong *apply'd*,
To griſly Pluto and his gloomy bride. *Pope.*

9. To buſy; to keep at work: an antiquated ſenſe; for which we now uſe *ply*.—She was ſkilful in *applying* his humours; never ſuffering fear to fall to deſpair, nor hope to haſten to aſſurance. *Sidney.* 10. To act upon; to ply.—

A varlet running towards haſtily,
Whoſe flying feet ſo faſt their way *apply'd*,
That round about a cloud of duſt did fly.
Fairy Queen.

(2.) * *To* APPLY. *v. n.* 1. To ſuit; to agree.—Would it *apply* well to the vehemency of your affection that I would win what you would enjoy? *Shakeſpeare.* 2. To have recourſe to, as a petitioner.—I had no thoughts of *applying* to any but myſelf; he deſired I would ſpeak to others. *Swift.* 3. To attack by way of influence.—God knows every faculty and paſſion, and in what manner they can be moſt ſucceſsfully *applied to*. *Rogers.*

(3.) *To* APPLY, among mathematicians, ſometimes ſignifies to transfer a line given into a circle, moſt commonly, or into any other figure; ſo that its ends may be in the perimeter of the figure. It is ſynonimous with *divide*, eſpecially among Latin writers.

APPOIDIARE, in old records, to lean, or prop up.

APPOGGIATURA, [from *appoggiare*, Ital. to lean on,] in muſic, a ſmall note inſerted by the practical muſician, between two others, at ſome diſtance.

* *To* APPOINT. *v. a.* [*appointer*, Fr.] 1. To fix any thing, as to ſettle the exact time for ſome tranſaction.—The time *appointed* of the father. *Gal.* iv. 2. 2. To ſettle any thing by compact.—He ſaid, *appoint* me thy wages, and I will pay it. *Geneſis.* 3. To eſtabliſh any thing by decree.—It was before the Lord, which choſe me before thy father, and before all his houſe, to *appoint* me ruler over the people of the Lord. 2 *Sam.* vi. 21. 4. To furniſh in all points; to equip; to ſupply with all things neceſſary: uſed anciently in ſpeaking of ſoldiers.—The Engliſh being well *appointed*, did ſo entertain them, that their ſhips departed terribly torn. *Hayward.*

APPOINTED, reſolved. *Chauc.*

(1.) APPOINTEE, a foot ſoldier in the French army, who, long before the revolution, was entitled, for long ſervice, and bravery, to receive pay above private ſentinels. This juſt regulation however, had long been ſuppreſſed, by the old government of that nation, except in the regiment of French guards, where forty appointees were ſtill retained to each company of 150 men. Till 1670, they had alſo captains and lieutenants, under the appellation of *appointees*, who without reſiding in the regiment, received their pay! See ANSPESSADES.

(2.) APPOINTER, in heraldry, is when two or more things are placed touching each other at the points or ends.

* APPOINTER. *n. ſ.* [from *appoint*.] He that ſettles or fixes any thing or place.

(1.) * APPOINTMENT. *n. ſ.* [*appointment*, Fr.] 1. Stipulation; the act of fixing ſomething in which two or more are concerned.—They had made an *appointment* together, to come to mourn with him, and to comfort him. *Job* ii. 11. 2. Decree; eſtabliſhment.—The ways of death be only in his hands, who alone hath power over all fleſh, and unto whoſe *appointment* we ought with patience meekly to ſubmit ourſelves. *Hooker.* 3. Direction; order.—

That good fellow,
If I command him, follows my *appointment*;
I will have none ſo near elſe. *Shakeſpeare.*

4. Equipment; furniture.—

Here art thou in *appointment* freſh and fair,
Anticipating time with ſtarting courage. *Shak.*

5. An allowance paid to any man, commonly uſed of allowances to publick officers.

(2.) APPOINTMENT is alſo often uſed in the ſame ſenſe with aſſignation.

(3.) APPOINTMENT, likewiſe, in a ſenſe ſimilar to the 5th explanation, above ſtated by Dr Johnſon, (§ 1.) denotes a penſion, given by princes to perſons of worth, to retain them in their ſervice. The term was chiefly uſed among the French, before the revolution. The kings of France gave large appointments to officers in their ſervice. They differed from wages, in that the latter were fixed and ordinary, being paid by the ordinary treaſurers; whereas appointments were annual gratifications granted by *brevet*, for a time uncertain, and were paid out of the privy purſe. Theſe, and ſimilar laviſh expenditures of the public money, haſtened the fall of the old government.

* *To* APPORTION. *v. a.* [from *portio*, Lat.] To ſet out in juſt proportions.—Try the parts of the body, which of them iſſue ſpeedily, and which ſlowly; and, by *apportioning* the time, take and leave that quality which you deſire. *Bacon.*

* APPORTIONMENT, *n. ſ.* [from *aportion*.] A dividing of a rent into two parts or portions, according

according as the land whence it iſſues, is divided among two or more proprietors. *Chambers.*

APPORTUM, in old law, a revenue, or profit ariſing from any thing.

APPOSAL OF SHERIFFS is the charging them with money, received on their account in the exchequer, 22 & 23 Car. II.

* *To* APOSE. *v. a.* [*appono*, Lat.] 1. To put queſtions to. This word is not now in uſe, except that, in ſome ſchools, to put grammatical queſtions to a boy, is called, to *poſe* him; and we now uſe *poſe* for *puzzle*.—Some procure themſelves to be ſurpriſed at ſuch times, as it is like the party that they work upon will come upon them: and to be found with a letter in their hand, or doing ſomewhat which they are not accuſtomed; to the end they may be *appoſed* of thoſe things which of themſelves they are deſirous to utter. *Bacon.* 2. A latiniſm. To apply to.—By malign putrid vapours, the nutriment is rendered unapt of being *appoſed* to the parts. *Harvey.*

APPOSER, [from *ad*, to, and *pono*, to put,] an examiner. In the court of exchequer, there is an officer called the *foreign appoſer*. In the office of confirmation, in the liturgy of Edward VI. the rubric directs the biſhop, or ſuch as he ſhall appoint, to appoſe a child; and a biſhop's examining chaplain was anciently called his poſer. See laſt article.

To APPOSIN, *v. a.* To oppoſe. *Chaucer.*

* APPOSITE. *adj.* [*appoſitus*, Lat.] Proper; fit; well adapted to time, place, or circumſtances.—The duke's delivery of his mind was not ſo ſharp, as ſolid and grave, and *appoſite* to the times and occaſions. *Wotton.*

* APPOSITELY. *adv.* [from *appoſite*.] Properly; fitly; ſuitably.—We may *appoſitely* compare this diſeaſe, of a proper and improper conſumption, to a decaying houſe. *Harvey.*—When we come into a government, and ſee this place of honour allotted to a murderer, another filled with an atheiſt or a blaſphemer, may we not *appoſitely* and properly aſk, Whether there be any virtue, ſobriety or religion, amongſt ſuch a people? *South.*

* APPOSITENESS. *n. ſ.* [from *appoſite*.] Fitneſs; propriety; ſuitableneſs.—Judgment is either concerning things to be known, or of things done, of their congruity, fitneſs, rightneſs, *appoſiteneſs*. *Hale's Origin of Mankind.*

(1.) * APPOSITION. *n. ſ.* [*appoſitio*, Lat.] 1. The addition of new matter, ſo as that it may touch the firſt maſs.—Urine, inſpected with a microſcope, will diſcover a black ſand; wherever this ſand ſticks, it grows ſtill bigger, by the *appoſition* of new matter. *Arbuthnot on Diet.* 2. In grammar, the putting of two nouns in the ſame caſe; as, *Liber Suſannæ matris*, the book of his mother Suſan.

(2.) APPOSITION is uſed in phyſics, in ſpeaking of bodies which derive their growth from the adjunction or union of neighbouring bodies. Moſt bodies of the foſſile or mineral kingdom, are formed by *juxta-poſitions*, or the *appoſition* of parts, brought to join and adhere to each other.

APPOSITORIUM, in chemiſtry, a veſſel made of earthen ware or glaſs, of a conical figure, whoſe biggeſt end receives the neck of a green retort, while the narrower is inſerted into the receiver. Its uſe is, where a ſtrong open fire is required, to prevent the red hot retort, by the immediate contact of its neck, from burſting the receiver.

* *To* APPRAISE. *v. a.* [*apprecier*, Fr.] To ſet a price upon any thing, in order to ſale.

(1.) * APPRAISER. *n. ſ.* [from *appraiſe*.] A perſon appointed to ſet a price upon things to be ſold.

(2.) APPRAISERS are not a ſeparate profeſſion; appraiſing being practiſed by brokers of houſehold furniture; to whom the name is chiefly applied: Upholſterers and joiners are alſo employed, or even any perſons who are ſuppoſed to be ſkilled in the commodities to be appraiſed or valued.—They are employed in caſes of death, executions upon goods, or of ſtock to be transferred, or divided; and are called ſworn appraiſers, from their taking an oath to do juſtice between parties. They ſometimes appraiſe on behalf of both ſides, each party agreeing to have the ſame appraiſer; ſometimes in oppoſition, each party chooſing one or more of a ſide; and ſometimes by commiſſion or deputation of truſtees, maſters in chancery, &c.

APPRAISING, the act of rating, valuing, or ſetting a price on goods, by a perſon who is a competent judge, and is authoriſed thereto. See APPRAISER, § 1, and 2.

* *To* APPREHEND. *v. a.* [*apprehendo*, Lat. to take hold of] 1. To lay hold on.—There is nothing but hath a double handle, or at leaſt we have two hands to *apprehend* it. *Taylor.* 2. To ſeize in order for trial or puniſhment.—The governor kept the city with a garriſon, deſirous to *apprehend* me 2 *Cor.* xi. 32. 3. To conceive by the mind.—The good which is gotten by doing, cauſeth not action; unleſs, *apprehending* it as good, we like and deſire it. *Hooker.* 4. To think on with terrour; to fear.—From my grandfather's death, I had reaſon to *apprehend* the ſtone; and, from my father's life, the gout. *Temple.*

* APPREHENDER. *n. ſ.* [from *apprehend*.] Conceiver; thinker.—Groſs *apprehenders* may not think it any more ſtrange, than that a bullet ſhould be moved by the rarefied fire. *Glanville.*

APPREHENDRE. See APPRENDRE.

* APPREHENSIBLE. *adj.* [from *apprehend*.] That which may be apprehended, or conceived.—The north and ſouthern poles are incommunicable and fixed points, whereof the one is not *apprehenſible* to the other. *Brown's Vulgar Errours.*

(1.) * APPREHENSION. *n. ſ.* [*apprehenſio*.] 1. The mere contemplation of things, without affirming or denying any thing concerning them.—So we think of a horſe, high, ſwift, animal, time, matter, mind, death, &c. *Watts.*—Simple *apprehenſion* denotes no more than the ſoul's naked intellection of an object, without either compoſition or deduction. *Glanville.* 2. Opinion; ſentiments; conceſſion.—The expreſſions of ſcripture are commonly ſuited in thoſe matters to the vulgar *apprehenſions* and conceptions of the place and people where they were delivered. *Locke.* 3. The faculty by which we conceive new ideas, or power of conceiving them.—

I nam'd them as they paſs'd, and underſtood
Their

Their nature, with ſuch knowledge God indu'd
My ſudden *apprehenſion*. *Milton.*

4. Fear.—It behoveth that the world ſhould be held in awe, not by a vain ſurmiſe, but a true *apprehenſion* of ſomewhat which no man may think himſelf able to withſtand. *Hooker.*—

And he the future evil ſhall no leſs
In *apprehenſion*, than in ſubſtance, feel. *Milton.*

5. Suſpicion of ſomething to happen, or be done.

I'll note you in my book of memory,
And ſcourge you for this *apprehenſion*. *Shak.*

6. Seizure.—

See that he be convey'd unto the Tower:
And go we brothers to the man that took him,
To queſtion of his *apprehenſion*. *Shak.*

7. The power of ſeizing, catching or holding.—A lobſter hath the chely or great claw of one ſide longer than the other, but this is not their leg, but a part of *apprehenſion*, whereby they ſeize upon their prey. *Brown's Vulgar Errours.*

(2.) APPREHENSION, in logic, (ſee § 1, def. 1.) differs from *notion*, as the act of the mind, whereby a notion is formed, differs from an act of the mind, whereby we attend to a notion already formed.

(3.) APPREHENSION, is likewiſe uſed to expreſs an inadequate, and imperfect idea: and thus it is applied to our knowledge of God, in contradiſtinction to comprehenſion.

* APPREHENSIVE. *adj.* [from *apprehend*] 1. Quick to underſtand.—If conſcience be naturally *apprehenſive* and ſagacious, certainly we ſhould truſt and rely upon the reports of it. *South.* 2. Fearful.—The inhabitants of this country, when I paſſed through it, were extremely *apprehenſive* of ſeeing Lombardy the ſeat of war. *Addiſon.* 3. Perceptive feeling.—

Thoughts, my tormentors, arm'd with deadly ſtings,
Mangle my *apprehenſive* tendereſt parts. *Milt.*

* APPREHENSIVELY. *adv.* [from *apprehenſive.*] In an apprehenſive manner.

* APPREHENSIVENESS. *n. ſ.* [from *apprehenſive.*] The quality of being apprehenſive.—Whereas the vowels are much more difficult to be taught, you will find by falling upon them laſt, great help by the *apprehenſiveneſs* already gained in learning the conſonants. *Holder.*

APPRENDRE, in our ancient law books, a fee or profit to be taken or received.

(1.) * APPRENTICE. *n. ſ.* [*apprenti*, Fr.] One that is bound by covenant, to ſerve another man of trade, for a certain term of years, upon condition, that the artificer, or tradeſman, ſhall, in the mean time, endeavour to inſtruct him in his art or myſtery. *Cowel.*—Love enjoineth ſuch diligence, that no *apprentice*, no, no bond ſlave could ever be more ready than that young princeſs was. *Sidney.*

(2.) APPRENTICES, LAWS, &c. RESPECTING. Apprentices many be bound to huſbandmen, or even to gentlemen; and they, as well as tradeſmen, in England, are compellable to take the children of the poor, whom the overſeers, with the conſent of two juſtices may bind till the age of years. Apprentices may be diſcharged, on cauſe; but if any, whoſe premium has [illegible] than L. 10, run away from their maſters, they are compellable to ſerve out the time of abſence, or give ſatisfaction for it, at any period within 7 years after expiration of the original contract. Apprentices gain a ſettlement in that pariſh where they laſt ſerved 40 days; and by the 5th of Elizabeth, c. 4. they have an excluſive right to exerciſe the trade in which they have been inſtructed, in any part of England. See *Blackſtone's Com.* Vol. i. p. 426. &c. Anciently, benchers in the inns of court were called apprentices of the law, in Latin *apprenticii juris nobiliores*; as appears by Mr Selden's note on Forteſcue: and Finch, in his *Nomotechnia*, writes himſelf, *apprentice de ley*: Sir Edward Coke, in his Inſtitutes, ſays, *apprenticii legis*, in pleading, are called *homines conſiliarii et in lege periti*; and in another place, apprentices and other counſellors of law. Apprentices indentures and articles of clerkſhip, pay of duty ſix ſhillings. Pariſh indentures are excepted, and pay ſixpence only, by 5 W. 3. c. 21. For fees given with apprentices, clerks, or ſervants, bound or articled by indentures, from L. 1. to L. 50, maſters pay for every pound ſixpence; and for fees above L. 50, 1 ſhilling in the pound. 8 Ann. c. 9.

* *To* APPRENTICE. *v. a.* [from the noun.] To put out to a maſter as an apprentice.—

Him portion'd maids, *apprentic'd* orphans bleſt,
The young who labour, and the old who reſt. *Pope.*

* APPRENTICEHOOD. *n. ſ.* [from *apprentice.*] The years of an apprentice's ſervitude.—

Muſt I not ſerve a long *apprenticehood*
To foreign paſſages, and in the end,
Having my freedom, boaſt of nothing elſe
But that I was a journeyman to grief! *Shak.*

(1.) * APPRENTICESHIP. *n. ſ.* [from *apprentice.*] The years which an apprentice is to paſs under a maſter.—In every art, the ſimpleſt that is, there is an *apprenticeſhip* neceſſary, before it can be expected one ſhould work. *Digby.*

(2.) APPRENTICESHIPS, DURATION OF. Seven years ſeem anciently to have been, all over Europe, the uſual term eſtabliſhed for the duration of apprenticeſhips in the greater part of incorporated trades. All ſuch incorporations were anciently called *univerſities*; which indeed, is the proper Latin name for any incorporation whatever. The univerſity of ſmiths, the univerſity of taylors, &c. are expreſſions which we commonly meet with in the old charters of ancient towns. When thoſe particular incorporations which are now peculiarly called univerſities, were firſt eſtabliſhed, the term of years which it was neceſſary to ſtudy in order to obtain the degree of A. M. appears evidently to have been copied from the term of apprenticeſhip in common trades, of which the incorporations were much more ancient. As to have wrought 7 years under a maſter properly qualified was neceſſary in order to intitle any perſon to become a maſter, and to have himſelf apprentices in a common trade; ſo to have ſtudied 7 years under a maſter properly qualified was neceſſary to entitle him to become a maſter, teacher, or doctor (words anciently ſynonymous), in the liberal arts, and to have ſcholars or appren-

tices (words likewiſe originally ſynonymous) to ſtudy under him. By the 5th of Elizabeth, commonly called the *ſtatute of apprenticeſhip*, it was enacted, that no perſon ſhould for the future exerciſe any trade, craft, or myſtery, at that time exerciſed in England, unleſs he had previouſly ſerved to it an apprenticeſhip of 6 years at leaſt; and what before had been the bye-law of many particular corporations, became in England the general and public law of all trades carried on in market-towns. For though the words of the ſtatute are very general, and ſeem plainly to include the whole kingdom, by interpretation its operation has been limited to market towns; it having been held, that in country villages a perſon may exerciſe ſeveral different trades, though he has not ſerved a 7 years apprenticeſhip to each, they being neceſſary for the conveniency of the inhabitants, and the number of people frequently not being ſufficient to ſupply each with a particular ſet of hands. By a ſtrict interpretation of the words, too, the operation of this ſtatute has been limited to thoſe trades which were eſtabliſhed in England before the 5th of Elizabeth, and has never been extended to ſuch as have been introduced ſince that time. This limitation has given occaſion to ſeveral diſtinctions which, conſidered as rules of police, appear as fooliſh as can well be imagined. It has been adjudged, for example, that a coachmaker can neither himſelf make, nor employ journeymen to make, his coach wheels, but muſt buy them of a maſter wheelwright; this latter trade having been exerciſed in England before the 5th of Elizabeth. But a wheelwright, though he has never ſerved an apprenticeſhip to a coachmaker, may either himſelf make, or employ journeymen to make, coaches; the trade of a coachmaker not being within the ſtatute, becauſe not exerciſed in England at the time when it was made. The manufactures of Manchester, Birmingham, and Wolverhampton, are many of them upon this account not within the ſtatute; not having been exerciſed in England before the fifth of Elizabeth. In France, before the revolution, (we know not how theſe matters ſtand *now*,) the duration of apprenticeſhips was different in different towns and in different trades. In Paris, 5 years was the term required in a great number; but before any perſon could be qualified to exerciſe the trade as a maſter, he was obliged, in many of them, to ſerve 5 years more as a journeyman. During this latter term he was called the *companion* of his maſter, and the term itſelf was called his *companionſhip*;—a kind of anticipation of the *equality* that has ſince taken place.—In Scotland there is no general law which regulates univerſally the duration of apprenticeſhips. The term differs in different incorporations. Where it is long, a part of it may be generally redeemed by paying a ſmall fine. In moſt towns, too, a very ſmall fine is ſufficient to purchaſe the freedom of any corporation. The weavers of linen and hempen cloth, the principal manufactures of the country, as well as all other artificers ſubſervient to them, wheelmakers, reelmakers, &c. may exerciſe their trades in any town corporate without paying any fine. In all towns corporate, all perſons are free to ſell butcher's meat upon any lawful day of the week. Three years is in Scotland a common term of apprenticeſhip, even in ſome very nice trades; and in general there is no country in Europe in which corporation laws are ſo little oppreſſive.

(3.) APPRENTICESHIPS, REMARKS ON. Apprenticeſhips were altogether unknown to the ancients. The reciprocal duties of maſter and apprentice make a conſiderable article in every modern code. The Roman law is perfectly ſilent with regard to them. There is no Greek or Latin word which expreſſes the idea we now affix to the word APPRENTICE. (See § 1.) Long apprenticeſhips Dr Smith conſiders as altogether unneceſſary. The arts, which are much ſuperior to common trades, ſuch as thoſe of making clocks and watches, contain no ſuch myſtery as to require a long courſe of inſtruction. The firſt invention of ſuch beautiful and uſeful machines, indeed, and even that of ſome of the inſtruments employed in making them, muſt, no doubt, have been the work of deep thought and long time, and may juſtly be conſidered as among the happieſt efforts of human ingenuity: But when both have been fairly invented and are well underſtood; to explain to any young man, in the completeſt manner, how to apply the inſtruments and how to conſtruct the machines, cannot well require more than the leſſons of a few weeks; perhaps thoſe of a few days might be ſufficient. In the common mechanic trades, thoſe of a few days might certainly be ſufficient. The dexterity of hand, indeed, even in common trades, cannot be acquired without much practiſe and experience. But a young man would practiſe with much more diligence and attention, if from the beginning he wrought as a journeyman, being paid in proportion to the little work which he could execute, and paying in his turn for the materials which he might ſometimes ſpoil through awkwardneſs and inexperience. His education in this way generally would be more effectual, and always leſs tedious and expenſive. The maſter, indeed, would be a loſer; he would loſe all the wages of the apprentice, which he now ſaves, for ſeven years together. In the end, perhaps, the apprentice himſelf would be a loſer. In a trade ſo eaſily learnt he would have more competitors; and his wages, when he came to be a complete workman, would be much leſs than at preſent. The ſame increaſe of competition would reduce the profits of the maſters as well as the wages of the workmen. The trades, the crafts, the myſteries, would be all loſers: but the puplic would be a gainer; the work of all artificers coming in this way much cheaper to market.

To APPRETIATE. *v. a.* [*apprecier*, Fr. of *appreciare*, Lat.] To ſet a high price, value or eſteem upon any thing. *Bailey.*

APPRISING, in Scots law, the name of that action by which a creditor formerly carried off the eſtate of his debtor for payment. It is now aboliſhed, and adjudications are appointed in place of it.—Adjudications, charter, reſignation, charter conſtat, cognition of heirs, heritable right, confirmation, novodamus, principal and original inſtrument of ſurrender, retour ſeiſin, and ſaſine, in Scotland, pay by different acts 4 s. 9 d. ſter-

APPRIZE. *n. f.* an enterprise; a trial. *Chauc.*

* *To* APPRIZE. *v. a.* [*apprendre*; part. *appris*, Fr.] To inform; to give the knowledge of any thing.—He considers the tendency of such a virtue or vice; he is well *apprized*, that the representation of some of these things may convince the understanding. *Watts.*—

But if *apprix'd* of the severe attack,
The country be shut up, lur'd by the scent
On church yard drear (inhuman to relate),
The disappointed prowlers fall. *Thomson.*

(1.) * APPROACH. *n. f.* [from the verb.] 1. The act of drawing near.—If I could bid the seventh welcome with so good a heart as I can bid the other, farewel, I should be glad of his *approach*. *Shak.* 2. Access.—Honour hath in it the vantage ground to do good: the *approach* to kings and principal persons; and the raising of a man's own fortunes. *Bacon.* 3. Hostile advance.—

For England his *approaches* make as fierce
As waters to the sucking of a gulph. *Shakes.*

4. Means of advancing.—

Against beleagur'd heav'n the giants move,
Hills pil'd on hills, on mountains mountains lie,
To make their mad *approaches* to the sky. *Dryd.*

(2.) APPROACH. See ACCESS and APPROXIMATION. The curve of equable approach, *accessus æquabilis*, first proposed by M. Leibnitz, has given the annalists some trouble.—The business is to find a curve, wherein a body descending by the sole power of gravity shall approach the horizon equally in equal times.—This curve has been found by Bernouilli, Varignon, Maupertuis, and others, to be the second cubical parabolla so placed as that its point of regression is uppermost.

* *To* APPROACH. *v. a.* To bring near to. This sense is rather French than English.—This they will nimbly perform, if objected to the extremes, but slowly and not at all, if *approached* unto their roots. *Brown's Vulgar Errours.*—By plunging paper thoroughly in weak spirit of wine, and *approaching* it to a candle, the spirituous parts will burn, without harming the paper. *Boyle.*

* *To* APPROACH. *v. n.* [*approcher*, Fr.] 1. To draw near locally.—'Tis time to look about: the powers of the kingdom *approach* apace. *Shakesp.* 2. To draw near, as time.—

Hark! I hear the sound of coaches,
The hour of attack *approaches*. *Gay.*

3. To make a progress towards, in the figurative sense, as mentally.—He was an admirable poet, and thought even to have *approached* Homer. *Temple.*—To have knowledge in all the objects of contemplation, is what the mind can hardly attain unto; the instances are few of those who have, in any measure, *approached* towards it. *Locke.*

APPROACHABLE. *adj.* that may be approached.

* APPROACHER. *n. f.* [from *approach*.] The person that approaches or draws near.—

Thou gav'st thine ears, like tapsters, that bid welcome.
To knaves and all *approachers*. *Shakes.*

APPROACHES, in fortifications the works thrown up by the besiegers, in order to get nearer a fortress, without being exposed to the enemy's cannon.

(1.) APPROACHING, in fowling, a term used to express such devices as are contrived for the getting within shot of shy birds. It is principally used in marshy low places. The best method of approaching is by means of three hoops tied together at proper distances according to the height of the man that is to use it, and having boughs of trees tied all round it, with cords to hang it over his shoulders; a man getting into this, conceals himself, and approaches by degrees towards his game in the form of a moving bush. Geese, ducks, and teal, quit the waters in the evening, and pass the night in the fields; but at the approach of morning they return to the water again, and even when on the water they will retire to great distances, on the approach even of a horse or cow, so that the business of the stalking horse is of little use; but this device of approaching by the moving bush succeeds tolerably well with them.

(2.) APPROACHING, in gardening, the inoculating or ingrafting the sprig of one tree into another, without cutting it off the parent-tree.

* APPROACHMENT. *n. f.* [from *approach*.] The act of coming near.—As for ice, it will not concrete, but in the *approachment* of the air, as we have made trial in glasses of water, which will not easily freeze. *Brown's Vulgar Errours.*

(1.) * APPROBATION. *n. f.* [*approbatio*, Lat.] 1. The act of approving, or expressing himself pleased or satisfied.—

That not past me, but
By learned *approbation* of my judges. *Shakes.*

2. The liking of any thing.—There is no positive law of men, whether received by formal consent as in councils, or by secret *approbation*, as in customs, but may be taken away. *Hooker.*—The bare *approbation* of the worth and goodness of a thing, is not properly the willing of that thing; yet men do very commonly account it so. *South.* 3. Attestation; support.—

How many now in health
Shall drop their blood in *approbation*
Of what your reverence shall incite us to. *Shak.*

(2.) APPROBATION, in civil law. It is a maxim among civilians, *Approbare dicitur qui non improbat.* He is judged to approve who does not disapprove. By the civil law, a mere approbation of a crime after commission, does not make a person guilty, but an approbation attended with fact, is equivalent to a command.

(3.) APPROBATION, in ethics, a state or disposition of the mind wherein we put a value upon, or become pleased with, some person or thing. Moralists are divided on the principle of approbation, or the motive which determines us to approve and disapprove. The Epicureans will have it to be only *self-interest*; according to them, that which determines any agent to approve his own action, is its apparent tendency to his private happiness; and even the approbation of another's action flows from no other cause but an opinion of its tendency to the happiness of the approver, either immediately or remotely. Others resolve approbation into a moral sense, or a principle of benevolence, by which we are determined to approve every kind affection either in ourselves or others, and all publicly useful actions, which we imagine to flow from such affection, without any view to our own private happiness. Dr Adam

Smith thinks it needleſs to introduce any new power of perception, in order to account for the principle of approbation; and apprehend that *ſympathy* is ſufficient to account for all the effects aſcribed to this peculiar faculty. This ſyſtem places virtue in utility, and accounts for the pleaſure with which the ſpectator ſurveys the utility of any quality, from ſympathy with the happineſs of thoſe who are affected by it. This ſympathy, he obſerves, is different both from that by which we enter into the motives of the agent, and from that by which we go along with the gratitude of the perſons who are benefited by his actions: and he ſays, it is the ſame principle with that by which we approve of a well contrived machine. According to others, reaſon or the underſtanding, the ſame faculty by which we diſtinguiſh between truth and falſehood, enables us to diſtinguiſh between what is fit and unfit, amiable and odious, both in actions and affections: and they argue, that ſuch are the natures of certain actions, that when perceived, as they are, by a reaſonable being, there muſt reſult in him certain emotions and affections. An excellent writer adds, that "in contemplating the actions and affections of moral agents, we have both a perception of the underſtanding, and a feeling of the heart; and the latter, or the effects in us accompanying our moral perceptions, are deducible from two ſprings. They partly depend on the poſitive conſtitution of our natures; but the moſt ſteady and univerſal ground of them is the eſſential congruity between the object and the faculty." But we fear none of all theſe theories, however plauſible, are ſufficiently perfect to account for the principle of approbation, and the various and oppoſite phænomena ariſing from its exerciſe among different nations. The fact ſeems to be, that there is no univerſal and uniform innate principle of approbation diſcoverable in man; elſe we would not find ſome nations practiſing, approving of, and even enjoying barbarities, which thoſe of more civilized countries cannot ſo much as read of without the utmoſt abhorrence. See AMERICANS, § 13, 24. ANSICANS, ANTHROPOPHAGI, § 3, &c. In a word, the foundation of this and every ſimilar principle can only be aſcribed to education and habit; which as they vary in different countries, ſufficiently account for the various and oppoſite motives of approbation and diſapprobation, that take place among mankind.

(4.) APPROBATION, in literary hiſtory, is uſed in ſpeaking of recommendations of books, given by perſons qualified or authoriſed to judge of them. Thoſe appointed to grant licences, and imprimatures, under arbitrary governments, frequently expreſs their approbation of books. Books were formerly ſubjected to a licence in England, by the 13th Car. II. c. 33. which act is long ſince expired; and being incompatible with the noble principles of the revolution, has never ſince, and we hope never will be revived.

* APROOF, *n. ſ.* [from *approve*, as *proof* from *prove*.] Approbation; condemnation: a word rightly derived, but old.—

O moſt perilous mouths,
That bear in them one and the ſelf-ſame tongne
Either of condemnation or *approof!* *Shakeſp.*

* *To* APPROPERATE. *v. a.* [*apropero*, Lat.] To haſten; to ſet forward. *Dict.*

* *To* APPROPINQUATE. *v. n.* [*appropinquo*, Lat.] To draw nigh unto; to approach.

* *To* APPROPINQUE. *v. n.* [*appropinquo*, Lat.] To approach; to draw near to. A ludicrous word.—

The clotted blood within my hoſe,
That from my wounded body flows,
With mortal criſis doth portend
My days to *appropinque* an end. *Hudibras.*

* APPROPRIABLE. *adj.* [from *appropriate*.] That which may be appropriated; that which may be reſtrained to ſomething particular.—The conceit applied unto the original of men, and the beginning of the world, is more juſtly *appropriable* unto its end. *Brown's Vulgar Errours.*

APPROPRIARE AD HONOREM, in law, ſignifies to bring a manor within the extent and liberty of ſuch an honour.

APPROPRIARE COMMUNEM, in law, ſignifies to diſcommon, *i. e.* to ſeparate and incloſe any parcel of land, which before was open common.

(1.) * APPROPRIATE. *adj.* [from the verb.] Peculiar; conſigned to ſome particular uſe or perſon; belonging peculiarly.—He did inſtitute a band of fifty archers, by the name of yeomen of his guard; and that it might be thought to be rather a matter of dignity, than any matter of diffidence *appropriate* to his own cafe, he made an ordinance not temporary, but to hold in ſucceſſion for ever. *Bacon.*—The heathens themſelves had an apprehenſion of the neceſſity of ſome *appropriate* act of divine worſhip. *Stillingfleet.*

(2.) APPROPRIATE, in law, is underſtood of a church or benefice, the patronage whereof is annexed to ſome church dignitary, who appoints a vicar to ſerve the cure; the patron receiving the chief produce of it. See APPROPRIATION, § 2. There are computed to be in England 5445 churches appropriate and impropriate.

APPROPRIATED, } (3.) APPROPRIATE, or } in philoſophy, is underſtood of ſomething which is indeed common to ſeveral; yet, in ſome reſpects, is peculiarly attributed to one.

* *To* APPROPRIATE. *v. a.* [*approprier*, Fr. *appropio*, low Lat.] 1. To conſign to ſome particular uſe or perſon.—Things ſanctified were thereby in ſome ſort *appropriated* unto God, as that they might never afterwards again be made common. *Hooker.*—As for this ſpot of ground, this perſon, this thing, I have ſelected and *appropriated*, I have incloſed it to myſelf and my own uſe; and I will endure no ſharer, no rival or companion in it. *South.*—

Some they *appropriated* to the gods,
And ſome to publick, ſome to private ends.
Roſcommon.

2. To claim or exerciſe; to take to himſelf by an excluſive right.—

To themſelves *appropriating*
The ſpirit of God, promis'd alike, and giv'n
To all believers. *Milton.*

—Why ſhould people engroſs and *appropriate* the common benefits of fire, air, and water, to themſelves? *L'Eſtrange.*—Every body elſe has an equal title to it; and therefore he cannot *appropriate*, cannot incloſe, without the conſent of all his fellow-commoners.

commoners, all mankind. *Locke.* 3. To make peculiar to ſomething; to annex by combination. —We, by degrees, get ideas and names, and learn their *appropriated* connection one with another. *Locke.* 4. In law, to alienate a benefice. See APPROPRIATION.—Before Richard II. it was lawful to *appropriate* the whole fruits of a benefice to an abbey, the houſe finding one to ſerve the cure; that king redreſſed that horrid evil. *Ayliffe.*

(1.) * APPROPRIATION. *n. ſ.* [from *appropriate.*] 1. The application of ſomething to a particular purpoſe.—The mind ſhould have diſtinct ideas of the things, and retain the particular name, with its peculiar *appropriation* to that idea. *Locke.* 2. The claim of any thing as peculiar.—He doth nothing but talk of his horſe, and make a great *appropriation* to his good parts, that he can ſhoe him himſelf. *Shakeſp.* 3. The fixing a particular ſignification to a word.—The name of faculty may, by an *appropriation* that diſguiſes its true ſenſe, palliate the abſurdity. *Locke.* 4. In law, a ſevering of a benefice eccleſiaſtical to the proper and perpetual uſe of ſome religious houſe, or dean, and chapter, biſhoprick, or college; becauſe, as perſons ordinarily have no right of fee ſimple, theſe, by reaſon of their perpetuity, are accounted owners of the fee ſimple; and therefore are called proprietors. To an *appropriation*, after the licence obtained of the king in chancery, the conſent of the dioceſan, patron, and incumbent, are neceſſary, if the church be full; but if the church be void, the dioceſan and the patron, upon the king's licence, may conclude. *Cowell.*

(2.) APPROPRIATION, in the cannon law, a ſevering of a benefice eccleſiaſtical to the proper and perpetual uſe of ſome religious houſe. The contrivance of appropriations ſeems to have ſprung from the policy of the monaſtic orders, who have never been deficient in ſubtle inventions for the increaſe of their own power and emoluments. At the firſt eſtabliſhment of parochial clergy, the tithes of the pariſh were diſtributed in a fourfold diviſion; one for the uſe of the biſhop, another for maintaining the fabric of the church, a third for the poor, and the fourth to provide for the incumbent. When the fees of the biſhops became otherwiſe amply endowed, they were prohibited from demanding their uſual ſhare of theſe tithes, and the diviſion was into three parts only. And hence it was inferred by the monaſteries, that a ſmall part was ſufficient for the officiating prieſt; and that the remainder might well be applied to the uſe of their own fraternities, (the endowment of which was conſtrued to be a work of the moſt exalted *piety*) ſubject to the burden of repairing the church and providing for its conſtant ſupply. And therefore they begged and bought, for *maſſes* and *obits*, and ſometimes even for money, all the advowſons within their reach, and then appropriated the benefices to the uſe of their own corporation. But, to complete ſuch appropriation effectually, the king's licence, and conſent of the biſhop muſt firſt be obtained; becauſe both the king and the biſhop may ſome time or other have an intereſt, by lapſe, in the preſentation to the benefice; which can never happen if it be appropriated to the uſe of a corporation, which never dies: and alſo becauſe the law repoſes a confidence in them, that they will not conſent to any thing that ſhall be to the prejudice of the church. The conſent of the patron alſo is neceſſarily implied, becauſe the appropriation can be originally made to none but to ſuch ſpiritual corporation as is alſo the patron of the church; the whole being indeed nothing elſe but an allowance for the patrons to retain the tithes and glebe in their own hands, without preſenting any clerk, they themſelves undertaking to provide for the ſervice of the church. When the appropriation is thus made, the appropriators and their ſucceſſors are perpetual parſons of the church, and muſt ſue and be ſued in all matters concerning the rights of the church, by the name of *parſons*. See PARSON. This appropriation may be ſevered, and the church become diſappropriate, two ways; as, firſt, if the patron or appropriator preſents a clerk, who is inſtituted and inducted to the parſonage: for the incumbent ſo inſtituted and inducted is to all intents and purpoſes complete parſon; and the appropriation being once ſevered, can never be reunited again, unleſs by a repetition of the ſame ſolemnities. And, when the clerk ſo preſented is diſtinct from the vicar, the rectory thus veſted in him becomes what is called a *finecure*; becauſe he hath no cure of ſouls, having a vicar under him to whom that cure is committed. Alſo, if the corporation which has the appropriation is diſſolved, the parſonage becomes diſappropriate at common law; becauſe the perpetuity of perſon is gone, which is neceſſary to ſupport the appropriation. In this manner, and ſubject to theſe conditions, may appropriations be made at this day: and thus were moſt, if not all the appropriations at preſent exiſting originally made; being annexed to biſhopricks, prebends, religious houſes, nay, even to nunneries, and certain military orders, all of which were ſpiritual corporations. At the diſſolution of monaſteries, by ſtatutes 27 Hen. VIII. c. 28. and 31 Hen. VIII. c. 13. the appropriations of ſeveral parſonages, which belonged to thoſe reſpective religious houſes, (amounting to more than one third of all the pariſhes in England,) would have been, by the rules of the common law, diſappropriated, had not a clauſe in thoſe ſtatutes intervened, to give them to the king in as ample a manner as the abbots, &c. formerly held the ſame at the time of their diſſolution. This, though perhaps ſcarcely defenſible, was not without example; for the ſame was done in former reigns, when the alien priories (that is, ſuch as were filled by foreigners only) were diſſolved and given to the crown. And from theſe two roots have ſprung all the lay appropriations or ſecular parſonages now in the kingdom; they having been afterwards granted out from time to time by the crown. See VICAR.

* APPROPRIATOR. *n. ſ.* [from *appropriate.*] He that is poſſeſſed of an appropriated benefice. —Theſe *appropriators*, by reaſon of their perpetuities, are accounted owners of the fee ſimple; and therefore are called proprietors. *Ayliffe.*

* APPROVEABLE. *adj.* [from *approve.*] That which merits approbation.—The ſolid reaſon, or confirmed experience of any men, is very *approveable* in what profeſſion ſoever. *Brown.*

* APPRO-

hence $r = -0{\cdot}000048517$, &c.
Hence, $y = 2 + p + q + r$
$= 2 + 0{\cdot}1 - 0{\cdot}0054 - 0{\cdot}000048518$
$= 2{\cdot}094551483$,
the root of the equation $y^3 - 2y = 5$. And the approximation for the roots of literal equations is performed by Sir Iſaac Newton in the ſame manner.

(4.) APPROXIMATION, in medicine, a magnetical kind of cure, or method of tranſplanting a diſeaſe into ſome other ſubject, whether animate or vegetable, by bringing it in immediate contact with the patient.

APPRUARE. See APPROVER, § 2.

APPUI, in the manege, [*q. d.* reſt or ſtay upon the hand,] is the reciprocal effort between the horſe's mouth, and the bridle hand, or the ſenſe of the action of the bridle on the hand of the horſeman. A juſt appui of the hand, is the nice bearing up or ſtay of the bridle, ſo that the horſe being awed by the ſenſibility and tenderneſs of his mouth, dares not reſt too much upon the bit-mouth, nor check or beat upon the hand to withſtand it. A horſe is ſaid to have no appui when he is too apprehenſive of the hand and cannot bear the bit. He is ſaid to have too much appui, when he reſts or throws himſelf too much upon the bit. Horſes deſigned for the army ought to have a full appui upon the hand. To give a horſe a good appui, he ſhould be galloped, and put often back.

(1.) * APPULSE. *n. ſ.* [*appulſus*, Latin.] The act of ſtriking againſt any thing.—An hectick fever is the innate heat kindled into a deſtructive fire, through the *appulſe* of ſaline ſteams. *Harvey.*—In vowels, the paſſage of the mouth is open and free, without any *appulſe* of an organ of ſpeech to another: but, in all conſonants, there is an *appulſe* of the organs. *Holder.*

(2.) APPULSE, in aſtronomy, the approach of any planet to a conjunction with the ſun, or a ſtar. It is a ſtep towards a tranſit, occultation, conjunction, eclipſe, &c. M. Flamſtead, M. de la Hire, and others, have given obſervations of the moon's appulſes to the Pleiades.

(3.) APPULSE OF CATTLE, in the civil law, the right of driving them to water.

APPURTENANCES, or APPERTINANCES, in common law, things belonging to ſome other as their principal. Appurtenances may either be things corporeal, as hamlets belonging to a chief manor; or incorporeal, as liberties and ſervices of tenants. See APPENDANT, § 1. *def.* 3.

APREMONT, a town of France, in the department of Vienne. Lon. 0. 38. W. Lat. 46. 45. N.

* *To* APRICATE. *v. n.* [*apricor*, Lat.] To baſk in the ſun. *Dict.*

* APRICITY. *n. ſ.* [*apricitas.*] Warmth of the ſun: ſunſhine. *Dict.*

* APRICOCK, or } *n. ſ.* [from *apricus*, Lat.
(1.) * APRICOT. } ſunny.] A kind of wall fruit.

(2.) APRICOT, in botany. See PRUNUS.

(3.) APRICOT WATER. To a quart of water, put ſix or eight apricots ſliced, and the kernels bruiſed; boil the whole, to extract the taſte; and when cold, add four or five ounces of ſugar. When that is diſſolved, ſtrain it.

APRIES, or PHARAOH HOPHRAH, the ſon of Pſammis, king of Egypt; propheſied againſt by Jeremiah and Ezekiel. He oppreſſed his ſubjects, ruined Sidon, and ſome ſay he put Jeremiah to death. He thought neither God nor man could dethrone him; which, however, was eaſily done by Amaſis, and he himſelf was ſtrangled. See AMASIS.

(1.) * APRIL. *n. ſ.* [*Aprilis*, Lat. *Avril*, Fr.] The fourth month of the year, January counted firſt.—*April* is repreſented by a young man in green, with a garland of myrtle and hawthorn buds; in one hand primroſes and violets, in the other the ſign Taurus. *Peacham on Drawing.*—Men are *April* when they woo, December when they wed: Maids are May when they are maids, but the ſky changes when they are wives. *Shakeſ. As you like it.*

(2.) APRIL is the 2d month according to the computation of aſtronomers. It contains 30 days.—The word is derived from *aperio*, to open: becauſe the earth, in this month, begins to open her boſom for the production of vegetables. In this month the ſun travels through the ſign Taurus.

A PRIORI, a kind of demonſtration. See DEMONSTRATION.

APRIZE, adventurer. (*Obſ.*) *Bailey.*

(1.) * APRON. *n. ſ.* [A word of uncertain etymology, but ſuppoſed by ſome to be contracted from *afore one.*] A cloth hung before, to keep the other dreſs clean.—How might we ſee Falſtaff, and not ourſelves be ſeen?—Put on two leather jerkins and *aprons*, and wait upon him at his table as drawers. *Shakeſ.*—In theſe figures the dreſs is gathered up before them, like an *apron*, which you muſt ſuppoſe filled with fruits. *Addiſon.*

(2.) * APRON. [in gunnery.] A piece of lead which covers the touch-hole of a great gun.

(3.) APRON, in naval architecture, is a piece of curved timber fixed behind the lower part of the ſtern, immediately above the foremoſt end of the keel. Apron is alſo a name given to a platform or flooring of a plank, raiſed at the entrance of a dock, againſt which the dock gates are ſhut.

(4.) * APRON-MAN. *n. ſ.* [from *apron* and *man.*] A man that wears an apron; a workman; a manual artificer.—

You have made good work,
You and your *apron-men*, that ſtood ſo much
Upon the voice of occupation, and
The breath of garlick eaters. *Shakeſ.*

(5.) * APRON OF A GOOSE. The fat ſkin which covers the belly.

* APRONED. *adj.* [from *apron.*] Wearing an apron.—

The cobler *apron'd*, and the parſon gown'd. *Pope.*

APSE, a ſmall town in the Iſle of Wight, near Medina.

APSIDES. See APSIS, § 3.

APSINTHATUM, in phyſic, a kind of potion to ſtrengthen the ſtomach. See ABSINTHITES.

APSIRTIDES. See ABSYRTIDES.

(1.) APSIS, [ἁψὶς, Gr. or ABSIS, Lat.] The arched roof of a houſe, room, or oven, &c. alſo the ring or compaſs of a wheel.

(2.) APSIS, in eccleſiaſtical writers, denotes an

inner part in the ancient churches, wherein the clergy ſat, and where the altar was placed. It is ſuppoſed to have been thus called, becauſe covered with an arch. See ◊ 1. Apſis, in this ſenſe, amounts to the ſame with *choir*, *concha*, *camera*, and *preſbyterium*; and ſtands oppoſed to the *nave* or body of the church. The word is more particularly uſed for the biſhop's throne, in ancient churches; called *apſis graduata*, becauſe raiſed on ſteps above the ordinary ſeats.—It was alſo denominated *exedra*, and in later times *tribune*. *Apſis* is alſo uſed for a reliquary, or caſe wherein the relicts of ſaints were anciently kept which was round or arched at the top. The apſis was commonly placed on the altar: it was uſually of wood, ſometimes alſo of gold and ſilver, with ſculptures, &c.

(3.) * Apsis. *n. ſ. apſides*, plural. [ἁψις.]—Is applied, in aſtronomy, to two points in the orbits of planets, in which they are at the greateſt, and the leaſt diſtance from the ſun or earth. The higher *apſis* is more particularly denominated aphelion, or apogee; the lower, perihelion, or perigee. *Chambers.*—If bodies revole in orbits that are pretty near circles, and the *apſides* of theſe orbits be fixed, then the centripetal forces of thoſe bodies will be reciprocally as the ſquares of the diſtances. *Cheyne.*

APSLEY, a village in Suſſex near Bramber.

APSORUS. See Absorus.

APSYCHIA, [from α privative, and ψυχη, ſoul,] in medicine, a ſwooning or fainting away, called alſo *lypopſychia* and *apopſychia*.

APSYCTOS, [from α and ψυχω to cool,] a word uſed by the ancients, as the name of a ſtone found in Arcadia, and of the colour of iron, the quality of which they ſay was, that when once heated red hot, it would never grow cold again. It is eaſy to ſee that this is an impoſſibility; and that ſome errors among the ancients, and miſunderſtandings of their works by later writers, have given the occaſion for propagating ſo idle an opinion. We have ſome ſtones indeed in England, that when once heated, will retain a warmth a long time, but all the other accounts ſeem groundleſs; our warming ſtone, uſed in Cornwall and Yorkſhire to lay at the feet of people's beds, will retain warmth 8 or 10 hours; and there is a ſort of red ſtone cut out of the ſalt mountains near Cordova, and formed into broad tiles called *ruggiolos* by the Italians, which being once well heated, will retain a ſenſible warmth 24 hours; but theſe do not all come up to the qualities of this imaginary ſtone of the ancients. See Asbestos.

APSYRTUS, in the materia medica of the ancients, a name given to the common *marrubium*, or horehound, a plant at that time, as well as now, eſteemed good in coughs, and other complaints of the breaſt.

(1.) * APT. *adj.* [*aptus*, Lat.] 1. Fit.—This ſo eminent induſtry in making proſelytes, more of that ſex than of the other, groweth; for that they are deemed *apter* to ſerve as inſtruments in the cauſe. *Apter* they are through the eagerneſs of their affection; *apter* through a natural inclination unto piety; *apter* through ſundry opportunities, &c. Finally, *apter* through a ſingular delight which they take in giving very large and particular intelligence how all near about them ſtand affected as concerning the ſame cauſe. *Hooker.* 2. Having a tendency to; liable to.—Things natural, as long as they keep thoſe forms which give them their being, cannot poſſibly be *apt* or inclinable to do otherwiſe than they do. *Hooker.*—My vines and peaches on my beſt ſouth walls were *apt* to have a ſoot or ſmuttineſs upon their leaves and fruits. *Temple.* 3. Inclined to; led to; diſpoſed to.—You may make her you love, believe it; which, I warrant, ſhe is *apter* to do, than confeſs ſhe does. *Shakeſ. As you like it.*—Men are *apt* to think well of themſelves, and of their nation, of their courage and ſtrength. *Temple.*—One, who has not theſe lights, is a ſtranger to what he reads, and *apt* to put a wrong interpretation upon it. *Addiſ.*—Even thoſe who are near the court, are *apt* to deduct wrong conſequences, by reaſoning upon the motives of actions. *Swift.*—What we have always ſeen to be done in one manner, we are *apt* to imagine there was but that one way. *Bentley.*—4. Ready; quick: as an *apt* wit.—

I have a heart as little *apt* as yours,
But yet a brain that leads my uſe of anger
To better vantage. *Shakeſ.*

5. Qualified for.—Theſe brothers had a while ſerved the king in war, whereunto they were only *apt*. *Sidney.*—All that were ſtrong and *apt* for war, even them the king of Babylon brought captive to Babylon. 2 *Kings.*

(2.) Apt, or Apte, an ancient town in the department of the mouths of the Rhone, ſeated on the Calavon, 20 miles N. of Aix, 22 E. of Avignon, and 25 SE. of Orange. Its commerce conſiſts in prunes, coarſe ſerges and wax-chandlery, for which it has a great demand. It was formerly called Apta Julia. In the Notitiæ it is called *Civitas Aptenſium*: Pliny reckons it among the Latin towns. That it was a Roman colony, appears from an inſcription on a ſtone found at Arles. Lon. 5. 56. E. Lat. 43. 23. N.

* *To* Apt. *v. a.* [*apto*, Lat.] 1. To ſuit; to adapt.

We need a man that knows the ſeveral graces
Of hiſtory and how to *apt* their places;
Where brevity, where ſplendour, and where height,
Where ſweetneſs is required, and where weight.
B. Jonſon.

—In ſome ponds, *apted* for it by nature, they become pikes. *Walton.* 2. To fit; to qualify; to diſpoſe; to prepare.—

The king is melancholy,
Apted for any ill impreſſions. *Denham's Sophy.*

Apta Julia See Apt, N° 2.

* *To* Aptate. *v. a.* [*aptatum*, Lat.] To make fit.—To *aptate* a planet is to ſtrengthen the planet in poſition of houſe and dignities to the greateſt advantage, in order to bring about the deſired end. *Bailey.*

Apte. See Apt, N° 2.

(1.) Aptera, a claſſical name, [from α negative, and πτερον, a wing,] uſed for the Linnæus for the 7th order of inſects, comprehending ſuch as have no wings. It conſiſts of 14 genera and 297 ſpecies. Hill divides this order into two claſſes; viz.

1. Aptera Anarthra, inſects which have neither wings, nor limbs: and

2. Aptera Podaria, inſects, which have limbs, but no wings.

(II.) APTERA, an ancient town of Lycia.

(III. APTERA, APTERIA, or APTERON,) a town of Crete, (whose port was Cisamus) on the W. side of the island, 12 miles S. of Sidon, towards the montes Leuci, and as many from the Sinus Amphimales. Stephanus says, it was so called from the Sirens, who, being there vanquished in song by the Muses, stript themselves of their wings, and out of grief leaped into the sea! Lon. 25. 0. E. Lat. 35. 50.

APTHANE, a title anciently given to the higher degrees of nobility in Scotland. See ABTHANES and THANE.

(1.) * APTITUDE. *n. s.* [French.] 1. Fitness.—This evinces its perfect *aptitude* and fitness for the end to which it was aimed, the planting and nourishing all true virtue among men. *Decay of Piety.* 2. Tendency.—In an abortion, the mother, besides the frustration of her hopes, acquires an *aptitude* to miscarry for the future. *Decay of Piety.* 3. Disposition.—He that is about children, should study their natures and *aptitudes*, what turns they easily take, and what becomes them; what their native stock is, and what it is fit for. *Locke.*

(2.) APTITUDE, or APTNESS, is often used, in speaking of the talents of the mind, for a promptitude, or disposition to learn things with ease and expedition. In which sense *aptness* amounts to the same with what the Greeks call ευφυια, *bona indoles*, and we sometimes stile *docility*. Charlton divides *aptness* into 3 parts, viz. *acuteness*, *sagacity* and *memory*.

* APTLY. *adv.* [from *apt.*] 1. Properly; with just connection, or correspondence; fitly.—

That part

Was *aptly* fitted, and naturally perform'd. *Shak.* 2. Justly; pertinently.—Irenæus very *aptly* remarks, that those nations, who were not possest of the gospels, had the same account of our Saviour, which are in the Evangelists. *Addison.* 3. Readily; acutely; as, he learned his business very *aptly*.

* APTNESS. *n. s.* [from *apt.*] 1. Fitness; suitableness.—The nature of every law must be judged of by the *aptness* of things therein prescribed, unto the same end. *Hooker.* 2. Disposition to any thing; of persons.—The nobles receive so to heart the banishment of that worthy Coriolanus, that they are in a ripe *aptness* to take all power from the people. *Shakes.* 3. Quickness of apprehension; readiness to learn.—What should be the *aptness* of birds, in comparison of beasts, to imitate speech, may be enquired. *Bacon.* 4. Tendency; of things.—Some seeds of goodness give him a relish of such reflections, as have an *aptness* to improve the mind. *Addison.*

APTON-COMB, a small town in the Isle of Wight, near Medina.

* APTOTE. *n. s.* [of α and πτωσις.] A noun which is not declined with cases.

APTOTON. See last article.

(I.) APUA, in ichthyology, the name of a small sea-fish, supposed by many to be produced by the slime and mud of the shores. But all such opinions are groundless. There are two species of this fish: viz.

1. APUA PHALERICA; and
2. APUA VERA.

(II.) APUA MEMBRAS, in ichthyology, a name by which some have called the pilchard.

APUFIS, a nation of Indians, in Brasil.

APULEIUS, Lucius, a Platonic philosopher, universally known by his performance of the Golden Ass. He lived in the 2d century, under the Antonines; and was born at Madaura, a Roman colony in Africa. He studied first at Carthage, then at Athens, and afterwards at Rome, where he learned the Latin tongue without the help of a master. He was a man of an inquisitive disposition, especially in religious matters: this prompted him to take several journeys, and to enter into several different societies of religion. He spent his whole fortune almost in travelling; so that, at his return to Rome, when he was about to dedicate himself to the service of Osiris, he had not money enough to defray the expence attending the ceremonies of the reception, and was obliged to pawn his clothes to raise the necessary sum. He supported himself afterwards by pleading causes; and as he was a great master of eloquence, and of a subtle genius, many considerable causes were trusted to him. But he availed himself more by a good marriage than by his pleadings: a widow named *Pudentilla*, who was neither young nor handsome, but wanted a husband and was very rich, took a great fancy to him. This marriage drew upon him a troublesome law-suit. The lady's relations, pretending he made use of sorcery to gain her heart and money, accused him of being a magician before Claudius Maximus proconsul of Africa. Apuleius was under no great difficulty of making his defence. As Pudentilla was determined from considerations of health, to enter upon a second marriage, even before she had seen this pretended magician, the youth, deportment, pleasing conversation, vivacity, and other agreeable qualities of Apuleius, were charms sufficient to engage her heart. He had the most favourable opportunities of gaining her friendship, for he lodged some time at her house: Pudentilla's eldest son, having a great friendship for him, was likewise desirous of the match, and solicited him in favour of his mother. "Do you make a wonder (said Apuleius, in his defence) that a woman should marry again, after having lived a widow 13 years? it is much more wonderful that she did not marry again sooner.—You think that magic must have been employed to prevail with a widow of her age, to marry a young man; on the contrary, this very circumstance shows how little occasion there was for magic." He offered to prove by his marriage contract, that he got nothing of Pudentilla but a promise of a very moderate sum, in case he survived her and had children by her. He was also obliged to make such confessions in court as Pudentilla would gladly have excused. He said she was neither handsome nor young, nor such as could any ways tempt him to have recourse to enchantments: and he added, that Pontianus her son proposed the marrying his mother to him only as a burden, and the action of a friend and philosopher. He also took notice of many inconveniencies which attend the marrying of widows, and spoke highly of the advantages of a maid above a widow: "A hand-

handſome virgin (ſaid he,) let her be ever ſo poor, is abundantly portioned; ſhe brings to her huſband a heart quite new, together with the flower and firſt fruits of her beauty. It is with great reaſon that all huſbands ſet ſo great a value upon the flower of virginity: all the other goods which a woman brings her huſband are of ſuch a nature, that he may return them again, if he has a mind to be under no obligation to her; that alone cannot be reſtored, it remains in the poſſeſſion of the firſt huſband. If you marry a widow, and ſhe leaves you, ſhe carries away all that ſhe brought you." The apology is ſtill extant, and is reckoned a very fine piece. Apuleius was indefatigable in his ſtudies; and compoſed ſeveral books in verſe and proſe; but moſt of them are loſt. He took great pleaſure in declaiming, and was heard generally with great applauſe: When he declaimed at Oeca, the audience cried out with one voice, that they ought to confer upon him the honour of citizen. The citizens of Carthage heard him with great ſatisfaction, and erected a ſtatue to him; and ſeveral other cities did him the ſame honour. Several critics have publiſhed notes on Apuleius's Golden Aſs, and there have been tranſlations of it into different languages.

APULI, the ancient people of APULIA.

APULIA, now called PUGLIA, a territory of Italy, bordering on the Adriatic, and extending from the river Frento to Tarentum in length, and from the Adriatic to the Lucani in breadth. It was divided into,

(1.) APULIA DAUNIA, now called Puglia Pinna, or the Capitanata; and,

(2.) APULIA PEUCETIA, now Terra di Barri. Apulia abounded in ſheep, which yielded the fineſt wool.

APURIMA, or APORAMAC, a rapid river of Peru, in S. America, 30 miles from the river Abanzai.

APURWACA, a river of Guiana, in S. America.

(1.) APUS, AVIS INDICA, in aſtronomy, a conſtellation of the ſouthern hemiſphere placed near the pole, between the *triangulum auſtrale* and the chameleon, ſuppoſed to repreſent the bird of paradiſe.

(2.) APUS, in entomology, a ſpecies of the *monoculus* genus of inſects.

(3.) APUS, in ornithology, a ſpecies of the ſwallow.

APUTTASY, in botany, a name given by the people of Guinea to a tree, a decoction of which is greatly uſed among them, for waſhing the mouth to cure the ſcurvy in the gums, and preſerve the teeth. *Phil. Tranſ.* N° 237.

(1.) APYCNI, in ancient muſic, was uſed for ſuch chords or ſounds of the ſcale, as could never enter the *ſpiſſum*. They were *ſtabiles*, or fixed.

(2.) APYCNI SUONI, in muſic, ſounds diſtant one or more octaves, and yet concord.

APYCNON, [from α and πυκνος,] *non ſpiſſimum, rarum*, in ancient muſic, was applied to thoſe two conjunct intervals of a tetrachord, which taken together were greater than the third. This happened only in the two diatonic genera.

APYCNOS, in muſic, is ſaid of the diatonic genus, on account of its having ſpacious intervals, in compariſon of the chromatic and enharmonic.

APYRENOS, properly ſignifies without kernels. The Greek writers, however, did not always keep ſtrictly to this ſenſe of the word, but ſometimes applied it to ſuch fruits as had fewer and ſofter kernels than others of the ſame kind.

APYREXY, in medicine, [from the privative α, and πυρ, heat,] the intermiſſion of a fever, or ague.

APYROI, in antiquity, a denomination given to altars, whereon ſacrifice was offered without fire.

APYROMETALLUM, in metallurgy, a name by which ſome authors have called gold, from its reſiſting the force of fire.

APYRON, ſomething that has not undergone the fire. In this ſenſe, *ſulphur vivum*, or native ſulphur, is particularly denominated *apyron*.—Some authors alſo give the denomination *apyron* to a modern proceſs for making *æthiops* mineral, without fire, by trituration alone.

APYROUS, a word applied to denote that property of ſome bodies, by which they reſiſt the moſt violent fire without any ſenſible alteration. Apyrous bodies ought to be diſtinguiſhed from thoſe which are *refractory*. Refractory ſubſtances are thoſe which cannot, by violent heat be fuſed, whatever other alteration they may ſuſtain. But a body, properly ſpeaking, apyrous, can neither be fuſed by heat, nor can undergo any other change. Diamonds were long thought to be poſſeſſed of this property. But ſome late experiments have ſhown, that diamonds may be entirely diſſipated or evaporated by heat, and are therefore not entitled to be ranked among apyrous ſubſtances. Perhaps there is no body in nature eſſentially and perfectly apyrous. But it is ſufficient that there be bodies apyrous relatively to the degree of fire which art can produce, to intitle them to that name.

(1.) * AQUA. *n. ſ.* [Latin.] A word ſignifying *Water*, very much uſed in chymical writings.

(2.) AQUA is by ſome ſuppoſed to be compounded of *a* and *qua*, i. e. *from which;* alluding to the opinion that water is the baſis of all bodies. The word frequently makes part of the name of medicines and other menſtruums, which though in a liquid form, poſſeſs powers and qualities very different from thoſe of *water:* ſuch as,

AQUA ALEXITERIA, AQUA ALUMINOSA, &c. } for all which, ſee PHARMACY, if not among the following articles, or not fully treated of, in their order.

AQUA APPIA. See AQUEDUCTS, § 4.

AQUA CÆLESTIS, among chemiſts, rectified wine.

AQUA CHRYSULCA, a ſubtle kind of *aqua regia*, called alſo *aqua pugilum*. Three parts of *ſal ammoniac*, and two of nitre, injected into a tubulated retort made red hot, yield this acid compound ſpirit.

AQUÆ AUGUSTÆ. See ACQS, N° 2, and AQUENSIS CIVITAS, N° 1.

AQUÆ BAJALUS, an ancient name for the clerk officiating under the chief miniſter, whoſe buſineſs was to aſſiſt him in carrying the holy water. The office correſponding to it at preſent is that of the pariſh clerk.

AQUÆ BILBILITANÆ, baths, 24 miles to the weſt of Bilbilis; now called Bauos de Alhama, in Arragon.

(1) AQUÆ CALIDÆ, a place in Britain, mentioned by Ptolemy, as belonging to the ancient Belgæ, and famous for its hot waters. Its modern name is Bath. See BATH, N° 1. Lon. 1. 5. W. Lat. 51. 20. N.

(2.) AQUÆ CALIDÆ, a Roman colony between the rivers Serbetes and Savus, in Mauritania Cæsarienſis.

(3.) AQUÆ CALIDÆ, the name of ſeveral other places. See AQUICALDENSIS.

AQUÆ CELENIÆ, } an ancient village, in Gallicia, ſeated on the Minho, mentioned by Ptolemy and Antonine, as famous for its waters. It is now named Caldas.

AQUÆ CONVENARUM, a hamlet of Gaul, in Aquitaine, and on the borders of the Convenee, or le Cominge, at the foot of the Pyrenees, near the ſource of the Garonne. It is now called Bagueres. Lon. 3. 39. W. Lat. 42. 20. N.

AQUÆ CUTILIÆ, a lake of the Sabines, in the territory of Reate, ſaid by Seneca and Pliny, to have had a floating iſland in it. Varro calls it Lacus Cutilienſis, and ſuppoſed it to be the centre of Italy. The waters were medicinal, and extremely cold, good for a weak ſtomach and in weak nerves; they ſeemed to act by a kind of ſuction, which approached to a bite. Veſpaſian uſed them every ſummer; and died there. It is now named Lago di Contigliano.

AQUÆDUCT. See AQUEDUCT, § 1. and 2.

AQUÆ ET IGNIS INTERDICTIO. See INTERDICTION.

AQUÆ FLAVIÆ, a town on the confines of Gallicia and Portugal, ſo called from the Veſpaſians. It is now called Chiaves, and is a mean hamlet: but the ruins of its bridge teſtify its former grandeur. Lon. 6. 6. W. Lat. 41. 40. N.

AQUÆ GRANII, the ancient name of AIX-LA-CHAPELLE. See § 1.

AQUÆ GRATIANÆ. See AIX, N° 2.

AQUÆ HAUSTUS, in the civil law, a right of drawing water, and carrying it through another's ground.

AQUÆ HELVETIÆ, a place deſcribed by Tacitus, as a municipal town, and much frequented for its excellent water; and though he does not mention its name, Cluverius ſuppoſes it to be Baden, in Switzerland, on the rivulet Limat, which ſoon after falls into the Aar. It is called the Upper, to diſtinguiſh it from another, called the Lower Baden, in Alſace. Lon. 8. 49. E. Lat. 47. 55. S.

AQUÆLICIUM. See AQUILICIUM.

AQUÆMANILIS, [from *aqua*, water, and *manus*, hand,] is uſed, in eccleſiaſtical writers, for a laver, anciently placed in the veſtibules of churches, to waſh the hands in.

AQUÆ MEROM, a place famous for the defeat of Jabin: ſuppoſed to be the lake called Samachonitis, or Semechonitis, by Joſephus; into which the river Jordan falls, before it comes to the ſea of Galilee.

AQUÆ PANNONIÆ, famous baths of Auſtria, now called Baden, 28 miles S. of Vienna.

AQUÆ PATAVINÆ, baths in the territory of Venice, near Padua, called *Fontes Aponi*, by Livy and Martial; now Bagni d'Abano. Lon. 13. 48. E. Lat. 45. 15. S.

AQUÆ PAVOR, is uſed by ſome for the hydrophobia.

AQUÆPOTES, [from *aqua*, and *potor*, to drink,] water drinkers.

AQUÆ QUINTIANÆ, a place put by Ptolemy, in room of the AQUÆ CILINÆ of Antonine; and now ſuppoſed to be Sarria, a town of Gallicia, on a rivulet of the ſame name, three leagues S. of Lugo.

AQUÆ SEXTIÆ, a colony N. of Marſeilles, ſo called, both from the founder, Sextius Calvinus, and from the number *(ſix,)* of its cold and hot ſprings; built after the defeat of the Salves, or Salvii, whoſe territory in the ſouth of Provence, reached from the Rhone to the borders of Italy. By an inſcription, the colony appears to have been either increaſed or renewed by Auguſtus. In the Notitia it is called *Civitas Aquenſis*. Its modern name is AIX. Here the Teutones and Cimbri were defeated with great ſlaughter by Marius.

AQUÆ SOLIS. See AQUÆ CALIDÆ, N° 1.

AQUÆ STATIELLÆ, or } a town in Liguria,
AQUÆ STATIELLORUM, } on the river Bormio; now called ACQUI, which ſee.

AQUÆ TARBELLICÆ. See ACQS, N° 2, and AQUENSIS CIVITAS, N° 1.

AQUÆ TAURI, an ancient town in Tuſcany, famous for its baths, at the diſtance of three miles from the ſea, ſaid to have been diſcovered by a bull, whence the appellation. The ruins of theſe baths are ſtill to be ſeen. The town is now called ACQUAPENDENTE, which ſee.

AQUA EXTINCTA, EXTINGUISHED WATER, is aquafortis into which ſome river water has been poured, in order to qualify it, and render it leſs corroſive. It is uſed to ſeparate the ſilver from the aquafortis which had been employed in parting the gold from it.

(1.) * AQUA FORTIS. [Latin.] A corroſive liquour made by diſtilling putrified nitre with calcined vitriol, or rectified oil of vitriol, in a ſtrong heat: the liquour, which riſes in fumes red as blood, being collected, is the ſpirit of nitre or *aqua fortis*: which ſerves as a menſtruum for diſſolving of ſilver, and all other metals except gold. —But if ſea ſalt, or ſal ammoniack, be added to *aqua fortis*, it commences *aqua regia*, and will then diſſolve no metal but gold. *Chambers.*—The diſſolving of ſilver in *aqua fortis*, and gold in aqua regia, and not *vice verſa*, would not be difficult to know. *Locke.*

(2.) AQUA FORTIS. This name is given by artiſts to nitrous acid of a certain ſtrength, from its diſſolving power: that which is concentrated and ſmoking, is called *ſpirit of nitre*. The aquafortis uſed by dyers, braſs founders, &c. is not only weaker than ſpirit of nitre, but contains a portion of vitriolic acid. It may be made by diſtilling crude nitre with calcined vitriol, equal parts. The nitrous acid, expelled by the vitriolic, will riſe in red fume, and paſs into the receiver. The vitriolic acid, uniting with the alkaline baſis of the nitre, forms vitriolated tartar; but, there being more vitriolic acid, than is requiſite to ſaturate the alkali, the ſurplus riſes with the nitrous acid: aquafortis, therefore, is a mixture of theſe two acids. It may alſo be made by diſtilling crude nitre,

itre, with ſomewhat more than half its weight f oil of vitriol; or by mixing one part of oil of itriol with nine parts pure ſpirit of nitre. See CID, NITROUS, and CHEMISTRY, INDEX.

AQUAGE, or AQUAGIUM, } a water courſe.

AQUA JULIA. See AQUEDUCTS, § 4.

AQUALICULUS, in anatomy, a name given y ſome to the region of the body, wherein the unk terminates, and the thighs commence, and which alſo the privities are placed. It is the me with what others call *pubes*, others the *hypoaſtrium*, *famen*, *imus venter*, &c. See ANATOY, § 265—323.

(1.) * AQUA MARINA, *of the Italian lapidaries*, of a ſea or bluiſh green. This ſtone ſeems to e to be the beryllus of Pliny. *Woodward.*

(2.) AQUA MARINA, the name by which the laidaries call the beryl. See BERYL.

AQUA MARTIA. See AQUEDUCTS, § 4.

AQUAMBOE, one of the greateſt kingdoms on e coaſt of Guinea in Africa, ſtretching 20 miles breadth, and ten times that ſpace in length rom E. to W. According to Bofman, the coaſt divided into a great number of petty royalies, but all of them ſubject to the king of Aquamboe, who indiſcriminately uſes an unlimited uthority over them and the meaneſt of his ſubects. His deſpotiſm gave riſe to a proverbial aying, that, "there are only two ranks of men t Aquamboe; the *royal family*, and *ſlaves*." The atives of this country are haughty, turbulent, nd warlike; and their power is formidable to all he neighbouring nations. They grievouſly infeſt ſuch nations as are tributaries to the king of Aquamboe, entering their territories by troops, and carrying off from the inhabitants whatever they think proper; nor do they ever meet with any oppoſition from the inhabitants, as they are ſenſible the king would not fail to reſent this as an indignity offered to him.

AQUA MERCURIALIS, a preparation of aqua regia, and ſublimate of mercury, with a little mercury, placed in a ſand heat, till the ſolution of the mercury be made. It is a mark of perfection of the aqua mercurialis, if it turn a piece of copper caſt into it, of a ſilver colour. It is by this water that the alchemiſts pretend, all metalline bodies may be reduced to their firſt matter, or mercury.

* AQUA MIRABILIS. [Latin.] The wonderful water, is prepared of cloves, galangals, cubebs, mace, cardomums, nutmegs, ginger, and ſpirit of wine, digeſted twenty-four hours, then diſtilled.

AQUA NAPHÆ, is a name given to the diſtilled water of orange flowers.

AQUANEGRA, or AQUA-NIGRA, } A ſmall town in Italy, in the Mantuaneſe, ſeated on the Chieſe, a little above its junction with the Oglio, 22 miles W. of Mantua. Lon. 30. 5. E. Lat. 45. 7. N.

* AQUA OMNIUM FLORUM, in pharmacy, ſignifies the diſtilled water of cows-dung, when they are at graſs. Some alſo call cows urine by this name; and, in Engliſh, all-flower-water!

AQUAPOISE, [from *aqua* and *poids*, Fr. weight,] an inſtrument for examining the weight of liquors.

AQUA PUGILUM. See AQUA CHRYSULCA.

(1.) * AQUA REGIA, or AQUA REGALIS. [Lat.] An acid water, ſo called becauſe it diſſolves gold, the king of metals. Its eſſential ingredient, is common ſea ſalt, the only ſalt which will operate on gold. It is prepared by mixing common ſea ſalt, or ſal ammoniac, or the ſpirit of them, with ſpirit of nitre, or common aqua fortis. *Chambers.*—He adds to his complex idea of gold, that of fixedneſs or ſolubility in *aqua regia*. *Locke.*

(2.) AQUA REGIA is compoſed of nitrous and marine acid, in different proportions according to the purpoſe for which it is intended. When made with ſal ammoniac, the common proportion is one part of this ſalt or four parts of nitrous acid; but to diſſolve platina, equal parts are requiſite. A purer aqua regia may be made by ſimply mixing the two acids. Aqua regia likewiſe diſſolves all other metals, except ſilver. The gold diſſolved in aqua regia is, in fact, diſſolved in the dephlogiſticated marine acid only, which, being deprived of its phlogiſton by the nitrous acid, recovers it from the gold, and thus renders gold ſoluble; for metals are not ſoluble in acids until they loſe a part of their phlogiſton. See CHEMISTRY, INDEX.

AQUARIA. See AQUATTA.

AQUARIANS, 1. Chriſtians in the primitive church who conſecrated water in the euchariſt inſtead of wine. This they did under pretence of abſtinence, or, becauſe they thought it univerſally unlawful to eat fleſh or drink wine. Epiphanius calls them *Encratites*, from their abſtinence; St Auſtin, *Aquarians*, from their uſe of water; and Theodoret, who ſays they ſprang from Tatian, *Hydroporoſtatæ*, becauſe they offered water inſtead of wine. 2. There was another ſort of Aquarians, who did not reject the uſe of wine as unlawful; for they adminiſtered the euchariſt in wine at evening ſervice: but, in their morning aſſemblies, they uſed water, for fear the ſmell of wine ſhould diſcover them to the heathens.

AQUARIUS, the WATER-CARRIER, in aſtronomy, the 11th ſign in the zodiac, reckoning from Aries; from which alſo the 11th part of ecliptic takes its name.—The ſun moves through Aquarius in the month of January; it is marked thus, ♒ by aſtronomers. The poets feign, that Aquarius was Ganymede, whom Jupiter raviſhed under the ſhape of an eagle, and carried away into heaven, to ſerve as a cup bearer in the room of Hebe and Vulcan; whence the name.—Others hold, that the ſign was thus called, becauſe, when it appears in the horizon, the weather uſually proves rainy. The ſtars in this conſtellation, in Ptolemy's catalogue, are 45; in Tycho's 41; in Hevelius's 47; in Flamſtead's 108.

AQUARTIA, in botany, a genus of the tetandria monogynia claſs. The calyx is campanulated; the corolla is rotated, with linear diviſions; and the berry is four-ſeeded. There is but one ſpecies; viz.

AQUARTIA ACULEATA, a native of America.

AQUA SECUNDA, aqua fortis much diluted with pure water. It is employed in ſeveral arts, to clean the ſurface of metals and certain ſtones, and for various other purpoſes.

AQUA SICCA PHILOSOPHORUM, a cant term, invented by ſome alchemiſts for the flowers of zinc,

zinc, called by ſeveral other as unmeaning names, by theſe writers; as *fericum*, philoſophic cotton, and *talc*. A preparation of theſe flowers, by means of vinegar, has alſo been called oil of talc, and many great properties aſcribed to it; but it is truly no other than the oil of the grape, from which the vinegar was made, and has no title to any thing that has been ſaid of it.

AQUA SULPHURATA, ſulphur water, a new name for what was originally called *gas ſulphuris* by Van Helmont. See GAS.

AQUA TETRACHYMAGOGON, water purging the four humours of the body! *Bailey*.

AQUATIA, in writers of the middle age, a right of fiſhing three days in the year. In ancient deeds we find divers grants of this privilege of aquatia, AQUATURA, or AQUARIA. In ſome writings aquatia alſo ſignified a fee, or ſervice, paid for the privilege of fiſhing.

AQUATIC, or AQUATICAL, } See next article.

* AQUATICK. *adj.* [*aquaticus*, Lat. from *aqua*, water.] 1. That which inhabits the water.—Brutes may be conſidered as either aerial, terreſtrial, *aquatick*, or amphibious. *Aquatick* are thoſe whoſe conſtant abode is upon the water. *Locke*. 2. Applied to plants, that which grows in the water.—Flags, and ſuch like *aquaticks*, are beſt deſtroyed by draining. *Mortimer's Huſbandry*.

AQUATICUM, in writers of the middle age, a thing diluted with water.

* AQUATILE. *adj.* [*aquatilis*, Lat.] That which inhabits water.—We behold many millions of the *aquatile* or water frog in ditches and ſtanding plaſhes. *Brown's Vulgar Errours*.

AQUATILES DII, in the mythology, aquatic gods; ſuch as Neptune, Amphitrite, the Tritons, Naiads, &c.

AQUATINTA, a method of etching on copper, by which a ſoft and beautiful effect is produced, reſembling a fine drawing in water colours or Indian ink: one of the many valuable improvements which were made in the fine arts, towards the end of the 18th century.—Previous to the operation upon the plate, the following powder muſt be prepared. Take equal parts of aſphaltum and fine tranſparent roſin, and powder them ſeparately in a mortar. Sift through a muſlin ſieve, upon a ſheet of paper a thin ſtratum of the aſphaltum, above which ſift a ſimilar layer of the roſin, and upon this another layer of the aſphaltum, continuing theſe alternate layers till both of the powders are exhauſted. Then paſs the mixture both together through the ſame ſieve ſo as to mix them ſufficiently for uſe. Some, inſtead of the above mixture, uſe powdered gum ſandarach only. A copper plate being poliſhed in the uſual way, lay the etching ground upon it, and etch the outlines of the deſign in the manner directed under the article ETCHING. Then ſoften the ground with greaſe, and wipe it off with a rag, leaving as much greaſe upon the plate as juſt to dim the copper. Next ſift the powder upon the ſurface of the plate; after which, ſtrike the other ſide of it pretty ſmartly againſt the edge of a table to diſcharge it of the looſe powder. Then hold the back of the plate with a hand-vice over a chaffing-diſh of burning charcoal, till it become ſo hot as to give pain upon being touched with the back of the hand; and the powder which adhered to the greaſe will now be fixed to the plate. The plate being then ſuffered to cool, take turpentine varniſh mixed with ivory black; and with a hair pencil dipt in it, cover all the lights or places where there is no work or ſhade. A border of bees wax is now to be raiſed round the plate; and having diluted a quantity of aquafortis to a proper weakneſs with water, pour it on, and let it ſtand 5 minutes for the firſt or lighteſt ſhade; after which, pour it off; and having waſhed the plate with water, ſet it edgewiſe to dry. Then with varniſh ſtop out all the light ſhades, pour on the aquafortis for the ſecond tint, and let it ſtand 5 minutes more; proceeding in the ſame manner for every tint till you produce the darkeſt ſhades. If a bold open ground is wanted in any part, this requires an after operation. The ground muſt be laid as in the other caſe, by ſifting on the powder; only this powder muſt be much coarſer, and the plate more heated, that the particles of the powder may ſpread, and form ſmall circles: good clean roſin will do by itſelf. In etching landſcapes, the ſky and diſtant objects are alſo performed by a ſecond operation, and the powder is ſifted upon the plate with a finer ſieve. If the trees or any part of the fore ground require to be finiſhed higher, the plate muſt be entirely cleanſed from greaſe with bread, and a ground laid in the common way of etching; when the plate may be finiſhed as highly and neatly as poſſible with the needle or point, by ſtippling with dots, and biting in thoſe parts, or by a rolling wheel, which is more expeditious. If different colours are to be expreſſed in aquatinta, there will be required ſo many different plates, each having only that part etched upon it which is deſigned to be charged with its proper colour. It may happen, in particular ſubjects, that ſome of the colours are ſo diſtant from each other, as to allow the printer room to rub them in without blending; in which caſe, two or three different colours may be printed from the ſame plate at once. Where different plates are neceſſary, a ſeparate one, having a pin in each corner, muſt be provided as a ſole or bottom to the aquatinta plates; and theſe again muſt be exactly fitted, having each a ſmall hole in their corners for paſſing over the pins of the ſole: the ſaid pins ſerving the double purpoſe of retaining the plates ſucceſſively in their due poſition, and of directing the printer in placing the paper exactly on each plate ſo as not to ſhift; by which means each tint or colour will be exactly received on its proper place. This is the method practiſed in France. A landſcape or any ſimilar ſubject may be printed off at once in its different proper colours, by laying theſe upon the plate. In this caſe, the colours muſt be pretty thick in their conſiſtence; and the plate muſt be carefully wiped in the uſual way after laying on each tint, as well as receive a general wipe when charged with all the tints. The art of engraving in aquatinta is kept a ſecret by thoſe artiſts who practiſe it. In order to ſucceed in it, great care and judgment are requiſite; and much depends upon a certain nicety of management, which is only attainable by practice.

AQUATUM, in phyſical writers, a medicine diluted with water.

AQUATUM OVORUM is uſed by ſome naturaliſts, for what is otherwiſe called GRANDO, but more uſually CHALAZA.

AQUATURA. See AQUATIA.

* AQUA-VITÆ. [Latin.] It is commonly underſtood of what is otherwiſe called brandy, or ſpirit of wine, either ſimple or prepared with aromaticks. But ſome appropriate the term brandy to what is procured from wine, or the grape; *aquavite*, to that drawn after the ſame manner from malt. *Chambers.*—I will rather truſt a Fleming with my butter, an Iriſhman with my *aquavite* bottle, or a thief to walk with my ambling gelding, than my wife with herſelf. *Shakeſpeare.*

AQUA VITRIOLICA CERULEA, a form of medicine in the London Pharmacopœia, made in the following manner: take blue vitriol, 3 oz. alum and ſtrong ſpirit of oil of vitriol, of each 3 oz. water, a pint and a half; boil the ſalts in water till they are diſſolved, and then add the oil of vitriol, and finally ſtrain the whole through paper.

(1.) AQUAVIVA, Octavio, cardinal and archbiſhop of Naples; was deſcended of an illuſtrious family of that kingdom, and diſtinguiſhed himſelf by his love of letters and learned men. He entertained ſeveral of them in his ſervice, and had a particular friendſhip for the learned Peireſc. Pope Clement VIII. gave him the legation of Avignon, where he governed with great moderation and wiſdom.

(2.) AQUAVIVA, Claude, the ſon of the duke of Atri, was born in 1542. He entered into the ſociety of the Jeſuits, of which he became general in 1581. He was the author of ſome pieces relating to his order and religion, the beſt of which is one on the cure of mental diſeaſes. He died about 1607.

(3.) AQUAVIVA, a town of the kingdom of Naples, and province of Bari.

AQUE. See ACQS, N° 2. and AQUENSIS, N° 1.

(I.) AQUEDUCT, in anatomy, a bony kind of canal, or paſſage, in the *os petroſum*, ſuppoſed to contribute to the purpoſes of hearing.—It is called aqueduct not only on account of its form, but, as ſome alſo imagine, from its ſerving to diſcharge any foreign matters collected in the inner cavities of the ear.—It is ſometimes alſo called *aqueductus Fallopii*, from Fallopius, its firſt diſcoverer.—Several authors confound it with the *tuba Euſtachiana*. This aqueduct is ſometimes alſo called *meatus cæcus*; by others *meatus cochlearis*, *meatus capreolaris*; *meatus auditoris internus*, *foramen auditorium internum*, and *hydroparaſtates*. See ANATOMY, § 551—556.

(II. 1.) * AQUEDUCT. *n. ſ.* [*aqueductus*, Lat.] A conveyance made for carrying water from one place to another; made on uneven ground, to preſerve the level of the water, and convey it by a canal. Some *aqueducts* are under ground, and others above it, ſupported by arches.—Among the remains of old Rome, the grandeur of the commonwealth ſhews itſelf chiefly in temples, highways, *aqueducts*, walls, and bridges of the city. *Addiſon.*

(2.) AQUEDUCTS, DIFFERENT KINDS OF. Architects diſtinguiſh two kinds of aqueducts; the *viſible*, and the *ſubterraneous*.—The *viſible* are conſtructed in valleys or marſhes, and protracted in longitude or latitude as the ſituation requires. They are compoſed of adminicula for ſupporting the arches and confining the ſtream, and of arcades. The *ſubterraneous* are formed, by piercing the mountains, and conducting them below the ſurface of the earth They are built of ſtone, hewn, or rough; and covered above with vaults, or with flat ſtones, which may be termed *flags*; theſe flags ſhelter the water from the heat of the ſun. They divide themſelves into *double* and *triple* aqueducts; that is to ſay, ſuch as are ſupported either by two or by three ranges of arcades. Such was the aqueduct which Procopius records to have been built by Coſroës king of the Perſians, for the city of Petra in Mingrelia: it had three conduits upon the ſame line, each elevated above the other. Frequently aqueducts are paved. Sometimes the waters flow through a natural channel of clay. Frequently they are conveyed by pipes of lead into reſervoirs of the ſame metal, or into troughs of hewn ſtones. The channels are cut with an imperceptible deſcent, that the current may be accelerated by its own weight Parallel to its courſe, on each ſide, is cut a narrow foot path, where people may walk when neceſſary. By conduits, or grooves, the waters are conveyed into large ciſterns, but not forced above their original level. To make them riſe and iſſue from their apertures with force, they muſt be confined in tubes of a ſmall diameter, and abruptly fall from a conſiderable declivity.

(3.) AQUEDUCTS, IMMENSE EXTENT OF THE ANCIENT. Aqueducts of every kind were long ago the wonders of Rome; the vaſt quantity of them which they had; the prodigious expence employed in conducting waters over arcades from one place to another, at the diſtance of 30, 40, 60, and even 100 miles, which were either continued or ſupplied by other labours, as by cutting mountains and piercing rocks; all this may well ſurpriſe us; nothing like it is undertaken in our times: we dare not purchaſe conveniency at ſo dear a rate. Appius Claudius the cenſor adviſed and conſtructed the firſt aqueduct. His example gave the public luxury a hint to cultivate theſe objects; and the force of prodigious and indefatigable labour diverted the courſe of rivers and floods to Rome. Agrippa, in that year when he was ædile, put the laſt hand to the magnificence of theſe works. It is chiefly in this reſpect that the modern ſo much reſembles the ancient city of Rome. For this advantage ſhe is peculiarly indebted to Sixtus V. and to Paul V. who for grandeur and magnificence emulated the maſters of the univerſe. There are ſtill to be ſeen, in different places contiguous to Rome, ſtriking remains of theſe aqueducts; arches continued through a long ſpace, over which were extended the canals which carried the water to the city. The arches are ſometimes low, ſometimes raiſed to a vaſt height, to humour the tumidities or depreſſions of the ground. There are ſome which have two arcades, one conſtructed above the other; and this precaution was obſerved, leſt the height of a ſingle arcade, if extended as far as the ſituation required, might render the ſtructure leſs firm and permanent,

manent. They are commonly of bricks; which by their cement cohere ſo ſtrongly, that the parts are not ſeparated without the ut moſt difficulty.—When the elevations of the ground were enormous, it became neceſſary to form *ſubterraneous* aqueducts. Theſe carried the waters to ſuch aqueducts as were raiſed above ground in the declivity or at the foot of mountains. If the artificial channel of the water was not ſuſceptible of a downward bias but by paſſing through a rock; a paſſage was cut through this, at the ſame height with the ſuperior aqueduct: ſuch an one may be ſeen above the city of Tivoli, and at the place called *Vicavaro*. The canal which formed the courſe of the aqueduct is hewn out of the rock to the extent of more than a mile, about 5 feet in height and 4 in breadth. One ſingularity deſerves peculiar notice. Theſe aqueducts, which might have been directed in a ſtraight line to the city, did not arrive at it but by frequent and winding mazes. Some have ſaid that this oblique tract was purſued to avoid the expence which muſt attend the building of arcades to an extraordinary height: others, that it was their intention to diminiſh the impetuoſity of the current; which, rolling in a ſtraight line through an immenſe ſpace, muſt always have increaſed its velocity, muſt have worn the canals by perpetual and forcible attrition, and of conſequence, afforded an impure and unwholeſome draught to the inhabitants. But ſince there was ſo great a deſcent between the caſcade of Tivoli and Rome, it is demanded why they ſhould go to draw water from the ſame river at the diſtance of more than 20 miles higher; nay, of more than 30 miles, if we reckon the curvatures of its direction through that mountainous country? It is replied, the motive of obtaining the water more ſalubrious, and more limpid, was ſufficient to make the Romans think their labour neceſſary, and their expence properly beſtowed, and to thoſe who reflect that the waters of this river were impregnated with mineral particles, and by no means wholeſome, the anſwer will appear ſatisfactory. In the 4th volume of the Antiquities of Father Montfaucon, plate 128 ſhows, with how much care theſe immenſe works were conſtructed. From diſtance to diſtance ſpiramenta were left, that, if the water ſhould happen to be ſtopped by any accident, it might gradually diſembogue, till they could clear its ordinary paſſage. There were likewiſe, even in the very canals which conveyed the water, cavities conſiderably deeper than its internal ſurface, into which the ſtream was precipitated, and where it remained ſtagnant till it was refined from mud and feculence; and ponds, where it might expand itſelf till it was purified.

(4.) AQUEDUCTS, MAGNIFICENCE OF THE ANCIENT. The aqueduct of the AQUA MARTIA had an arch of 16 feet in diameter. The whole was compoſed of three different kinds of ſtone; one of them reddiſh, another brown, and a third of an earth colour. Above, there appeared two canals; of which the higheſt was fed by the new waters of the Tiverone, and the lower by what they called the *Claudian* river. The entire edifice is 70 Roman feet high. Near this aqueduct, we have in Father Montfaucon the plan of another with three canals; the higheſt ſupplied by the AQUA JULIA, that in the middle from Tepula, and the loweſt from the aqua Martia. The arch of the aqueduct of the aqua Claudia is of hewn ſtone, very beautiful; that of the aqueduct of the aqua Neronia is of bricks: they are each of them 72 Roman feet in height. The canal of the aqueduct, which was called AQUA APPIA, deſerves to be mentioned for a ſingularity which is obſerved in it; for it is not, like the others, plain, nor gradual in its deſcent; but much narrower at the lower than the higher end. The conſul Frontinus, who ſuperintended the aqueducts under the emperor Nerva, mentions nine of them which had each 13,594 pipes of an inch in diameter. Virgerus obſerves, that, in the ſpace of 24 hours, Rome received 500,000 hogſheads of water. Not to mention the aqueducts of Druſus, and Rhiminius, that which gives the moſt ſtriking idea of Roman magnificence, is the aqueduct of Metz, of which a great number of arcades ſtill remain. Theſe arcades croſſed the Moſelle, a river which is broad and vaſt at that place. The copious ſources of Gorze furniſhed water for the repreſentation of a ſea fight. This water was collected in a reſervoir: from whence it was conducted by ſubterraneous canals formed of hewn ſtone, and ſo ſpacious that a man could walk erect in them: it traverſed the Moſelle upon its ſuperb and lofty arcades, which may ſtill be ſeen at the diſtance of two leagues from Metz; ſo nicely wrought and ſo finely cemented, that except thoſe parts in the middle which have been carried away by the ice, they have reſiſted, and will ſtill reſiſt, the ſevereſt ſhocks of the moſt violent ſeaſons. From theſe arcades, other aqueducts conveyed the waters to the baths, and to the place where the naval engagement was mimicked.

(5.) AQUEDUCTS, MODERN. If we may truſt Colmenarus, the aqueduct of Segovia may be compared with the moſt admired labours of antiquity. There ſtill remain 159 arcades, wholly conſiſting of ſtones enormouſly large, and joined without morter. Theſe arcades, with what remains of the edifice, are 102 feet high; there are two ranges of arcades, one above another. The aqueduct flows through the city, and runs beneath the greateſt number of houſes which are at the lower end. After theſe enormous ſtructures, we may be believed when we ſpeak of the aqueduct which Lewis XIV. cauſed to be built near Maintenon, for carrying water from the river Bucq to Verſailles: it is perhaps the greateſt aqueduct now in the world; being 7000 fathoms in length, above 2560 in height, and containing no fewer than 242 arcades.

AQUEINTABLE. *adj.* eaſy to be acquainted with. *Chaucer.*

AQUELEIA. See AQUILEIA.

(1.) AQUENSIS CIVITAS, AQUÆ AUGUSTÆ, or AQUÆ TARBELLICÆ, a town of ancient Gaul, famous for its baths. It was ſituated on the Adour, in the ci-devant province of Gaſcony, which now forms a part of the department of Gers. It is now called ACQS, AQUS, or D'AX. See ACQS, N° 2.

(2.) AQUENSIS CIVITAS, the ancient name of Aix. See AIX, N° 1. and AQUÆ SEXTIÆ.

AQUEOUS. *adj.* (from *aqua*, water, Lat.] Watery.—The vehement fire requiſite to its fuſion, forced away all the *aqu-ous* and fugitive moiſture. *Ray on the Creation.*

AQUEOUS HUMOUR. See ANATOMY, § 573.

AQUEOUSNESS. *n. ſ.* [*aqueoſitas*, Lat.] Waterifhneſs.

AQUETTA, a kind of poiſon made much uſe of by the Roman women, under the pontificate of Alexander VIII.

AQUICALDENSIS, or AQUÆ CALIDÆ, the ancient name of ſeveral places: ſuch as, 1. a town of Gallicia; formerly in great repute for its public baths. Its ruins ſtill retain marks of its ancient Roman grandeur. It is now called ORENSE, and lies on the Minho, 54 miles SE. of Compoſtella. Lon. 8. 30. W. Lat. 42. 30. N. 2. A place in the bay of Carthage: and, 3 & 4. two towns N. of Gerunda in Catalonia, mentioned by Ptolemy.

AQIUFLAVIENSES, the inhabitants of Aquæ Flaviæ.

AQUIFOLIUM, in botany, holly, or bird lime. See ILEX.

(I.) AQUILA, a Jew, born in Pontus. He, with his wife, PRISCA, or PRISCILLA, had, for their buſineſs, to make leathern tents for the Roman troops. They were early converted to the Chriſtian faith; perhaps by Peter's pentecoſtal ſermon. After they had reſided ſome time at Rome, the edict of Claudius, baniſhing all Jews from that city, obliged them to leave it, and return to Corinth: where Paul lodged with them, and wrought at their buſineſs, till probably to pleaſe the Gentiles, he went and lodged with Juſtus. They attended Paul to Epheſus, where they expoſed their lives to protect him; and inſtructed Apollos in the way of the Lord more perfectly. They returned back to Rome; where a meeting of the Chriſtians was held in their houſe and where they were ſaluted by Paul, in his epiſtle to that church. They returned to Aſia, and dwelt in or near Epheſus; and were there when Paul wrote his 2d epiſtle to Timothy. Acts xviii. Rom. xvi. 4, 5. 2 Tim. iv. 19.

(II.) AQUILA, in aſtronomy, the EAGLE, a conſtellation of the northern hemiſphere; uſually joined with Antinnus. The ſtars in the conſtellation Aquilla and Antinous, in Ptolemy's catalogue, are 15; in Tycho's 19; in Hevelius's, 42; in the Britannic catalogue, 71.

(III.) AQUILA, in chemiſtry, has ſeveral ſignifications according to the epithets joined with it: ſuch as,

1. AQUILA ALBA, a combination of corroſive ſublimate, with freſh mercury, called *mercurius dulcis*:

2. AQUILA PHILOSOPHORUM, a term uſed by alchemiſts, to ſignify the reducing of metals to their primitive matter, &c.

(IV.) AQUILA, in geography, a fine large city of Italy, anciently called AVIA, and AVELLA, and the capital of Abruzzo, ſeated on a hill, on the banks of the river Alterno, or Peſcara, near its ſource. It has an ancient caſtle, and is a biſhop's ſee immediately under the pope. The land adjacent produces plenty of ſaffron. It was almoſt totally deſtroyed by an earthquake, in February 1701. The firſt ſhock was ſo terrible that the inhabitants abandoned the city; but returning to veſpers, it being Candlemas day, the ſhocks followed one another with ſuch violence, that 24,000 people periſhed, and great numbers were wounded; 800 were killed in one ſingle church: many other churches, monaſteries, noble buildings, and the town houſe, were either ſwallowed up or overturned, together with the greater part of the city and its walls. It is ſituated 35 miles W. from the Adriatic 92 E. of Rome, and about 16 from the confines of the Pope's dominions. Lon. 14. 20. E. Lat. 42. 40. N.

(V.) AQUILA, in ornithology, a ſynonime of eagle. See FALCO.

AQUILA-DEL-CAMPO, a ſmall town of Spain, in Old Caſtile.

AQUILÆ ARBOR, in botany, a name given by ſome authors to the tree, whoſe wood is the AGALLOCHUM, or lignum aloes of the ſhops.

AQUILANUS, Sebaſtianus, an Italian phyſician, was born at Aquila, in the kingdom of Naples. He practiſed with conſiderable reputation at Padua, and died there in 1543. He wrote ſome pieces on phyſical ſubjects, and was a zealous defender of Galen.

AQUILAR DEL CAMPO. See AQUILA-DEL-CAMPO.

(I.) AQUILEGIA, COLUMBINE: A genus of the pentagynia order, belonging to the polyandria claſs of plants; and in the natural method, ranking under the 16th order, Multiſiliquæ. It has no calyx: the petals are five, with a horn-like nectarium inſerted between each; and there are five ſeparate capſules. There are 4 ſpecies: viz.

1. AQUILEGIA ALPINA, with long oval flowers grows naturally near Ingleborough hill in Yorkſhire. The flowers are much larger than thoſe of the garden columbine.

2. AQUILEGIA CANADENSIS, or Canada columbine, flowers almoſt a month before the other ſorts, and therefore is preſerved in the gardens of the curious, though not at all remarkable for its beauty. There is a variety of this with taller flower ſtems.

3. AQUILEGIA INVERSA, or garden columbine. Of this there are great varieties, not only in the colour and fulneſs of their flowers, but alſo in their form. Theſe are commonly called *roſe columbine*; the colours are cheſnut, blue, red, and white, and ſome are finely variegated with two colours. There are others with ſharp pointed petals in form of a ſtar, and of theſe there are ſingle and double flowers of the ſame colours with the former.

4. AQUILEGIA VULGARIS, or wild columbine, with blue flowers, is found growing wild in ſome woods of England.

(II.) AQUILEGIA, CULTURE OF THE. All theſe ſpecies are propagated by ſowing the ſeeds, or parting the old roots; but the former method is chiefly practiſed, for the old roots are very apt to degenerate. The ſeeds ſhould be ſown in a nurſery bed in Auguſt or September; for thoſe which are kept till the ſpring ſeldom grow well, or at leaſt remain in the ground for a whole year. The ſpring following the plants will appear above ground, and ſhould be kept clear of weeds; and if the ſeaſon proves dry, they muſt be watered.

In the middle or latter end of May, they will be ſtrong enough to tranſplant; for which purpoſe ſome beds of good undunged earth ſhould be prepared, planting them therein at 8 or 9 inches diſtances from each other. In the following autumn, by which time the plants will have acquired ſtrength enough to flower the year following, the roots ſhould be carefully taken up and planted in the borders of the flower garden: but where their roots are deſigned to be preſerved in perfection, all the flower ſtalks muſt be cut off as ſoon as the flowers are paſt. In order to keep up a ſucceſſion of good flowers, freſh ſeeds ſhould be ſown every year; and it will likewiſe be advantageous to get an exchange of ſeeds from a diſtant place.

(III.) AQUILEGIA, MEDICINAL USES OF THE. Columbine has been looked upon as aperient; and was formerly in great eſteem among the common people for throwing out the ſmall pox and meaſles. A diſtilled water, mediated vinegar, and conſerve, were prepared from the flowers: but they have long given place to medicines of greater efficacy.

AQUILEIA, an ancient and large city of the Carni, or Veneti, in Italy, ſeated on the rivers, Natiſo and Turrus, about 30 miles W. of Trieſte. A Roman colony was ſettled in it, between the firſt and ſecond Macedonian wars, to be a bulwark againſt the neighbouring barbarians. It was afterwards increaſed with 2500 families by a decree of the ſenate; from which it became a very famous port. The emperor Julian aſcribes the appellation to the augury of an eagle at the time of building it; but Iſaac Voſſius on Mela, to the great plenty of water, as if the town were called Aquilegia. The harbour, at the mouth of the Natiſo, is diſtant 60 ſtadia from the city; ſo that ſhips of burden are towed up the river. In 452 it was beſieged by Attila with an innumerable hoſt of barbarians. The walls were aſſaulted by a formidable train of battering rams, moveable turrets, and engines, that threw ſtones, darts, and fire; and the monarch of the Huns employed the forcible impulſe of hope, fear, emulation, and intereſt, to ſupport the only barrier which delayed the conqueſt of Italy. Aquileia was at that period one of the richeſt, the moſt populous, and the ſtrongeſt of the maritime cities of the Adriatic coaſt. Three months were conſumed without effect in the ſiege; till the want of proviſions and the clamour of his army compelled Attila to relinquiſh the enterpriſe, and reluctantly to iſſue his orders that the troops ſhould ſtrike their tents the next morning and begin their retreat. But as he rode round the walls, penſive, angry, and diſappointed, he obſerved a ſtork preparing to leave her neſt in one of the towers, and to fly with her infant family towards the country. He ſeized, with the ready penetration of a ſtateſman, this trifling incident which chance had offered to ſuperſtition; and exclaimed in a loud and cheerful tone, that ſuch a domeſtic bird, ſo conſtantly attached to human ſociety, would never have abandoned her ancient ſeats unleſs thoſe towers had been devoted to impending ruin and ſolitude. The favourable omen inſpired an aſſurance of victory; the ſiege was renewed and proſecuted with freſh vigour; a large breach was made in the part of the wall from whence the ſtork had taken her flight: the Huns mounted to the aſſault with irreſiſtible fury; and the ſucceeding generation could ſcarcely diſcover the ruins of Aquileia. In the place, however, which is ſtill called Aquileia, there are ſeveral inſcriptions and antiquities to be ſeen, which are worthy of a traveller's notice: and, though dwindled into a poor village, it gives a title to the patriarch of Aquileia. The patriarch is named by the Venetians, and reſides at Udino, becauſe Aquileia belongs to the Houſe of Auſtria. Lon. 13. 30 E. Lat. 46. 20. N.

AQUILICIUM, AQUÆLICIUM, or AQUILICIANA, in antiquity, a ſacrifice, celebrated among the Romans, in time of exceſſive droughts, to obtain rain of the gods.

AQUILI DII, an epithet of ſome of the heathen gods, ſuppoſed to be black complexioned.

AQUILIFER, [from *aquila*, an agle, and *fero*, I bear,] among the Romans, an enſign bearer, who carried the ſtandard on which the eagle was repreſented.

* AQUILINE. *adj.* [*aquilinus*, Lat. from *aquila*, an eagle.] Reſembling an eagle; when applied to the noſe, hooked.—

His noſe was *aquiline*, his eyes were blue,
Ruddy his lips, and freſh and fair his hue. *Dryd.*

—Gryps ſignifies ſome kind of eagle or vulture: from whence the epithet *gyrpus* for an hooked or *aquiline* noſe. *Brown.*

AQUILO, is uſed by Vitruvius for the NE. wind: or that which blows at 45° from the N. towards the E. point of the horizon.—The poets gave the name of aquilo to all ſtormy winds dreaded by the mariner.

(1.) AQUILUS, among the ancients, a dark, or duſky colour, approaching to black.

(2.) AQUILUS, in ornithology, a ſpecies of pelican.

AQUIMINARIUM, in antiquity, a kind of luſtral veſſel, wherein the Romans carried their holy water for expiation, and other religious offices.

(1.) AQUINAS, St Thomas, ſtyled the Angelical Doctor, was of the ancient family of the counts of Aquino, deſcended from the kings of Sicily and Arragon; and was born in the caſtle of Aquino, in the Terra di Lavora in Italy, A. D. 1224 or 1225. He entered into the order of the Dominicans; and after having taught ſchool divinity in moſt of the univerſities of Italy, at laſt ſettled at Naples; where he ſpent the reſt of his life in ſtudy, reading lectures, and acts of piety; and was ſo far from the views of ambition or profit, that he refuſed the archbiſhoprick of that city, when it was offered him by Pope Clement IV. He died in 1274, leaving an amazing number of writings, which were printed at Venice in 17 vols. folio, A. D. 1490. He was canonized by Pope John XXII. in the year 1323; and Pius V. who was of the ſame order, with him, gave him, in 1567, the title of the Fifth Doctor of the church, and appointed his feſtival to be kept with the ſame ſolemnity as thoſe of the other four doctors. His authority has always been of great importance in the ſchools of the Roman Catholics. Lord Herbert, in his life of Henry VIII tells us, that one of the principal reaſons which induced that king to write againſt Luther was, that the latter had ſpoken contemptuouſly of Aquinas.

(2.) Aqui-

(2.) AQUINAS. See AQUINO, N° 3.

AQUINATES, the inhabitants of AQUINO, or AQUINUM.

AQUINUS. See AQUINO, N° 3.

(1.) AQUINO, Anthony, D', firſt phyſician to Lewis XIV. and grandſon of Philip D'AQUINO. See N° 3.

(2.) AQUINO, a town of Italy, in the kingdom of Naples, and Terra di Lavora; a biſhop's ſee, but ruined by the emperor Conrade, and now conſiſting of about 35 houſes. It was the birth-place of the poet Juvenal, and of Thomas Aquinas. It lies 30m. NW. of Capua. Lon. 14. 30. E. Lat. 41. 32. N.

(3.) AQUINO, Philip d', called in Latin, AQUINAS or AQUINIUS, having turned from Judaiſm, had a penſion from the clergy of France and acquired much reputation by his knowledge of the Hebrew language, which he taught at Paris, in the reign of Lewis XIII, as well as by the books he publiſhed; among which is his *Dictionarium Hebræo-Thalmudico-Rabbinicum.*

AQUINUM, in ancient geography, a large municipal town, and a Roman colony on the borders of the Samnites, waſhed by the river Melpha. It is now called AQUINO. See N° 2.

AQUIQUI, in natural hiſtory, the name of a particular ſpecies of monkey, called by the people of Braſil, the king-monkey, as being much larger than all the other monkies.

AQUISGRANUM, one of the ancient names of AIX-LA-CHAPELLE, (which ſee) ſo called from Claudius Granius, the brother of Nero, who frequented its baths and built a tower in it.

AQUITAINE, the ancient name of Guienne, a ci-devant province of France, which now forms the two departments of Gironde, and of Lot and Garonne. It formerly belonged to the kings of England, as deſcendants of William the Conqueror. Jerſey and Guernſey are all that now belong to the king of Great Britain, of the ancient dominions of Aquitaine and Normandy. See AQUITANIA and GUIENNE.

AQUITANI, the ancient inhabitants of Aquitaine.

AQUITANIA, in ancient geography, one of the three principal diviſions of Gallia Comata, deſcribed by Cæſar, as bounded by the Garonne, the Pyrenees, and the Ocean: this is the *Aquitania Vetus*, or *Cæſariana*. Auguſtus ſet different boundaries, viz. the Loire, the Cevennes, the Pyrenees, and the Ocean. It was called *Gallia Aquitanica*, by Pliny, and the old Notitiæ, *Provincia Aquitanica*. It now compriſes Guienne (which ſeems to be a corruption of Aquitania) and Gaſcony.

To AQUITE, *v. a.* To match. *(Obſ.) Bailey.*

AQUITER, a needle-caſe. *Bailey.*

AQUO, in ichthyology, a name by which ſome authors have called the AGONUS, a fiſh much approaching to the nature of the ALAUSA, or ſhad.

* AQUOSE. *adj.* [from *aqua*, Lat.] Watery; having the qualities of water. *Dict.*

AQUOSE DUCTS, *ductus Aquoſi*, the name given by Nuck to the AQUEOUS HUMOUR.

* AQUOSITY. *n. ſ.* [from *aquoſe.*] Waterineſs. *Dict.*

AQUULA, the name of a diſorder of the eyes, called alſo *hydatis.*

* A. R. *anno regni*; that is, the year of the reign: as, *A. R. G. R.* 20. *Anno regni Georgii regis vigeſimo*, in the twentieth year of the reign of king George.

AR, in ancient geography, the metropolis of Moab, in Arabia Petræa; and the royal reſidence, ſituated on the E. ſide of the river Arnon. It was called alſo *Rabba*; and to diſtinguiſh it from Rabba of the Ammonites, *Rabbat Moab.* On coins it is called *Rabbath Moma.* Euſebius ſays it was called *Areopolis* in his time, from *Ar* and *Polis.*— St Jerom ſays that this city was entirely deſtroyed by an earthquake when he was a young man.

(1.) ARA, in aſtronomy, a ſouthern conſtellation, conſiſting of eight ſtars.

(2.) ARA PARVA, the little altar, a denomination, in the ancient ſurgery, given to an elegant kind of bandage, ſaid to have been invented by Softratus.

(3.) ARA THURIBULI, the altar of incenſe, in aſtronomy, a ſouthern conſtellation, not viſible in our hemiſphere, conſiſting, according to Ptolemy, of ſeven ſtars; and according to Sharp's catalogue, annexed to that of Mr Flamſtead, of nine ſtars.

ARAB, or ARABIAN HORSE. See EQUUS.

ARABAH. See ARABIA, § 1 and 4.

ARABANT AD CURIAM DOMINI, [from *aro*, I plough,] in law, was intended of thoſe who held by the tenure of ploughing and tilling the lord's lands within the manor.

ARABESQUE, or ARABESK, ſomething done after the manner of the Arabians. ARABESQUE, GROTESQUE, and MORESQUE, are terms applied to ſuch paintings, ornaments of freezes, &c. wherein there are no human or animal figures, but which conſiſt wholly of imaginary foliages, plants, ſtalks, &c. The words take their riſe from hence, that the Moors, Arabs, and other Mahometans, uſe theſe kinds of ornaments; their religion forbidding them to make any images of men, or other animals. Arabeſc is uſed by Stephen Riou, Eſq. in his book on Architecture, for that ſtyle of building vulgarly called *Modern Gothic*, which he alſo terms *Saracenic* and *Moreſc*; the introduction of which he aſcribes to the Moors, Arabians, or Saracens. This manner of building was introduced into Europe through Spain. The Cruſades gave the Chriſtians an idea of Arabic architecture, which they afterwards imitated. Sir C. Wren diſtinguiſhes the heavy *Gothic* as *Anglo-Saxon*, the lighter as *Arabeſc.*

(1.) ARABIA, ANTIQUITY AND ETYMOLOGY OF. Arabia is an extenſive country on the E. of Aſia, famous from the remoteſt antiquity for the independency of its inhabitants during the vaſt conqueſts of the Aſſyrians, Perſians, Greeks and Romans; and, in later times, for being the centre of an empire equal, if not ſuperior, in extent to any that ever exiſted. Upon its antiquity, Mr Niebuhr, in his *Travels through Arabia*, obſerves, that, "If any people in the world afford in their hiſtory an inſtance of high antiquity, and of great ſimplicity of manners, the Arabs ſurely do. Coming among them, one can hardly help fancying one's ſelf ſuddenly carried backwards to the ages which ſucceeded immediately after the flood.— We are here tempted to imagine ourſelves among the old patriarchs, with whoſe adventures we

have been amuſed in our infant days. The language, however, which has been ſpoken for time immemorial, and which ſo nearly reſembles that which we have been accuſtomed to regard as of the moſt diſtant antiquity, completes the illuſion which the analogy of manners began." This country was, in the earlieſt ages, called ARABAH, concerning the etymology of which word there are various conjectures. It has moſt generally been derived from the Hebrew word ערב, ſignifying, *the weſt*, *mixture*, or *traffic*; but, according to M. Volney, *Arab*, in the ancient language of theſe countries, ſignifies a *ſolitude*, or *deſart*.

(2.) ARABIA, APPEARANCE, CLIMATE, &c. OF. M. Niebuhr, the lateſt European travellers into this extenſive country, gives the following brief deſcription of its general appearance and climate, "Interſected by ſandy deſarts, and vaſt ranges of mountains, it preſents on one ſide nothing but deſolation in its moſt frightful form, while the other is adorned with all the beauties of the moſt fertile regions. Such is its poſition, that it enjoys, at once, all the advantages of hot and of temperate climates. The peculiar productions of regions, the moſt diſtant from one another, are produced here in equal perfection. Having never been conquered, Arabia has ſcarcely known any changes, but thoſe produced by the hand of nature; it bears none of the impreſſions of human fury, which appear in ſo many other places. With all theſe circumſtances, ſo naturally calculated to engage curioſity, Arabia has been hitherto but very little known. The ancients, who made their diſcoveries of countries, by conquering them, remained ignorant of the ſtate and hiſtory of a region, into which their arms could never penetrate. What Greek and Latin authors mention concerning Arabia, proves, by its obſcurity, their ignorance of almoſt every thing reſpecting the Arabs. Prejudices relative to the inconveniencies and dangers of travelling in Arabia, have hitherto kept the moderns in equal ignorance." Other authors agree with Niebuhr, in repreſenting the climate as exceedingly various; the air in ſome places being quite mild and temperate, and in others ſo exceſſively hot and ſultry as to be abſolutely "poiſonous." Theſe effects Mr Neibuhr accounts for, by the different winds, which blow over this extenſive country. "The nature of the winds (he ſays) differs, in Arabia, with the points of the compaſs from which they blow, and the tract over which they reſpectively paſs. The ſame wind is, in different places, dry or moiſt, according as it blows over the ocean, or over deſarts. On the ſhores of the Perſian Gulph, the SE. wind is accompanied with a degree of moiſture which, when the heat is intenſe, occaſions violent ſweatings; the NW. paſſing over the great deſart, is more torrid, but leſs diſagreeable; this laſt wind heats metals in the ſhade, as if they were expoſed to the ſun: and its heat, ſuddenly added to that of the atmoſphere, often ſuffocates men and other animals. The Arabians, when they travel, carry with them garlic and dried grapes, for the reviving of ſuch perſons as may fall down fainting, from the effect of theſe hot blaſts. Notwithſtanding its torrid qualities, this NW. wind ſerves to cool their liquors for the Arabians, in the middle of ſummer. In order to this, they put their water into bardaks or unglazed pots, made of a ſort of porous earth; and then, leaving theſe pots in a place expoſed to the current of the hot wind, the water is thus rendered very cool; a circumſtance well known in hot countries, and aſcribed by naturaliſts to the effects of ſudden evaporation. Another wind, of a more dangerous nature, is the famous *Sam*, *Smum*, or *Sami'l*, which ſeldom blows within Arabia, but frequently upon its frontiers. This wind prevails only on the confines of the great deſart, where the agitation of the air forms a current for the vapours which are raiſed by the heat of the ſun from that parched territory. The places the moſt expoſed to this deſtructive wind, are the banks of the Euphrates, and ſometimes the environs of Mecca, when the N. wind blows from the deſart. It is not unknown in Perſia, on the borders of theſe arid plains; and it is ſaid to have been felt in ſome places in Spain, near the vaſt tracts of deſart ſands which deform that fine kingdom. The effects of the Smum are inſtant ſuffocation to every living creature that happen to be within the ſphere of its activity, and immediate putrefaction of the carcaſes of the dead. As a ſimilar rapidity of putrefaction has been obſerved to take place upon bodies deprived of life by thunder, or by the electric ſhock, it has been conjectured, that electrical matter, which is very generally diffuſed through nature, might be the cauſe of the peculiarly noxious qualities of the wind. The Arabians diſcern the approach of the Smum by an unuſual redneſs in the air; and they ſay that they feel a ſmell of ſulphur as it paſſes. However this may be, the only means by which any perſon can preſerve himſelf from ſuffering from the noxious blaſts, is, by throwing himſelf down with his face upon the earth, till this whirlwind of poiſonous exhalations has blown over; which always moves at a certain height in the atmoſphere. Inſtinct even teaches the brutes to incline their heads to the ground on theſe occaſions. The other meteors of Arabia are common to it with all other hot countries. A clear ſky, ſeldom obſcured by clouds, renders ſtorms very unfrequent in the plains. The air diſcharges its electric matter in globes of fire, and by the phenomena called ſhooting ſtars, which are not unfrequent, and of conſiderable bulk. In the moſt arid tracts, near the ſea, the dews are ſingularly copious.—But, notwithſtanding this humidity, the air is ſo pure that the inhabitants ſleep in the open air; I never ſlept ſounder than where I found my bed all wet with dew in the morning. There are, however, places where one dares not ſleep in the open air, for fear of being ſtruck with a palſy. By long experience the inhabitants of thoſe parts have learned what precautions to take, and theſe are always peculiarly neceſſary to an European unaccuſtomed to the climate."

(3.) ARABIA, BOUNDARIES, AND EXTENT OF. Arabia is bounded on the W. by Paleſtine, part of Syria, the iſthmus of Suez, and the Red ſea, called by the Arabs the ſea *Al Kolzom*; on the E. by the Euphrates, the Perſian gulf, and bay of Ormos; on the N. by part of Syria, Diyar-Becr, Irak, and Khuzeſtan; and on the S. by the ſtraits of Babel-Mandel and the Indian ocean. It grows narrower

arrower as we approach the frontiers of Syria nd Diyar-Becr; and, by reaſon of the proximity f the Euphrates to the Mediterranean, may be ooked upon as a peninſula, and that one of the rgeſt in the whole world. It lies between 12° nd 35°. of N. Lat. and 26° and 61°. of E. Lon. ts greateſt length from N. to S. is about 1430 iles; and its breadth from E. to W. is about 200.—Arabia Proper, however, is much narrow-r, including little more than what was compre-nded by the ancients under the name of ARA-IA FELIX, (See § 4. N° II.) and here the Arabs ave been ſettled almoſt ſince the flood.

(4.) ARABIA, DIVISIONS OF. The moſt ancient diviſion of the peninſula of Arabia was into *Arabah* and *Kedem*, as we learn from Scripture; he firſt of which implies the weſt, and the other he eaſt, denoting the ſituation of the two countries.—Ptolemy was the firſt who divided this peninſula into three parts, viz. Arabia Petræa, Arabia Deſerta, and Arabia Felix, which diviſion has generally prevailed ever ſince among European geographers. But Mr Niebuhr, who was expreſsly commiſſioned, along with other four gentlemen of abilities, by the king of Denmark, for the purpoſe of making diſcoveries, tells us that the Arabs know of no ſuch names or diviſions, "They divide their country," he ſays, "into 6 great provinces; Hedjas, lying along the Arabic Gulph, between Mount Sinai and Yemen, and extending inland ſo far back as to the confines of Nedsjed; Yemen, a province ſtretching from the border of Hedjas, along the Arabic Gulph and the Indian Ocean, to Hadramaut, and bounded on the N. by Nedsjed; Hadramaut, on the Indian Ocean, conterminous with Yemen on one ſide, and with Oman on the other, bounded northwards by Nedsjed; Oman, lying alſo on the ſhore of the Indian Ocean, and encompaſſed by the provinces of Hadramaut, Lachſa, and Nedsjed; Lachſa, or Hadsjar, extending along the Perſian Gulph, and having Nedsjed for its interior boundary; Nedsjed, comprehending all the interior country, and bounded by the other five provinces; its northern limits are the territories occupied by the Arabs in the deſart of Syria.—Theſe territories may indeed be reckoned a 7th province; and to them may alſo be added the deſcription of the Arabian eſtabliſhments on the ſouthern coaſt of Perſia." But however juſt this account of M. Niebuhr's may be, it is proper in a work ſuch as ours, to explain, under this article, thoſe diviſions and denominations by which Arabia has been hitherto beſt known; leaving the above new diviſions of M. Niebuhr's, to be more particularly illuſtrated in their order. See HEDJAS, HADRAMAUT, &c.

I. ARABIA DESERTA was bounded on the N. by the Euphrates, which ſeparated it from Meſopotamia; on the W. by Syria, Judæa, and Arabia Petræa; on the E. by a ridge of mountains which ſeparated it from Babylonia and Chaldæa; on the S. by Arabia Felix, from which it was likewiſe ſeparated by ſeveral ridges of hills. By far the greateſt part of this kingdom, as well as the former, was a loneſome deſart, diverſified only with plains covered with ſand, or mountains conſiſting of naked rocks and precipices; nor were they ever, except ſometimes at the equinoxes, refreſhed with rain. The few vegetables which they produced were ſtinted by a perpetual drought, and the nouriſhment afforded them by the nocturnal dews was greatly impaired by the heat of the ſun in the day time. Throughout the deſarts were found huge mountains of ſand, formed by the violence of the winds that continually blew over them in the day time, though they ceaſed in the night.—Wells and fountains were for the moſt part exceedingly rare; however, notwithſtanding the ſterility of theſe countries, the vaſt plains of ſand juſt now mentioned were interſperſed with fruitful ſpots, which appeared here and there like ſo many iſlands in the midſt of the ocean. Theſe being rendered extremely delightful by their verdure, and the more ſo by the neighbourhood of thoſe frightful deſarts, the Arabs encamped upon them: and having conſumed every thing they found upon one, removed to another, as is the cuſtom of their deſcendants the Bedoweens at this day. Theſe fruitful ſpots were likewiſe frequent in Lybia, and by the Egyptians called *auaſes*, or *abaſes*, as we learn from Strabo. The barren part of Arabia Felix, bordering upon the Red Sea, was in like manner interſperſed with abaſes; which probably gave the name of *Abaſeni* to a nation ſettled there, and in the adjacent fertile region.—A body of theſe, it is ſaid, croſſing the ſtraits of Babel-Mandel, paſſed into Ethiopia, which from them received the name of *Abaſia*. From this account of Arabia Deſerta, we may reaſonably conclude, that the towns ſaid by Ptolemy to have been ſituated in it were places of very little conſequence.

II. ARABIA FELIX, or THE HAPPY, according to Mr Niebuhr, contains the two provinces of YEMEN and HADRAMAUT, which ſee in their order. But according to ancient geographers it was bounded on the N. by the two kingdoms juſt deſcribed; on the S. by the Red Sea; on the E. and W. by part of that ſea, together with the Arabian and Perſian gulfs. In Strabo's time, it was divided into 5 provinces, by the oriental hiſtorians called *Yaman*, *Hejas*, *Teham*, *Najd*, and *Yamama*. In this diſtrict ſtood ſeveral towns, particularly Nyſa, famous for being the birthplace of Bacchus; and Muſa or Muza, a celebrated emporium or harbour, where the Arabian merchants reſorted with their frankincenſe, ſpices and perfumes. Theſe two were ſituated in the province of Yaman. In that of Hejaz ſtood the ſtill more famous cities of Mecca and Medina; alſo Thaiſa or Taiſa, Gjudda or Jodda, Yanbo or Al Yanbo, and Madian, the Modiano of Ptolomy, and the Midian or Madian of Scripture.

III. ARABIA PETRÆA, on the eaſt, was bounded by Syria and Arabia Deſerta; on the weſt, by Egypt, or rather the Iſthmus of Suez, which ſeparates Aſia from Africa, and the Heropolitan gulph or weſtern arm of the Red Sea; on the north, by Paleſtine, the lake Aſphaltites, and Cœloſyria; and on the ſouth, by Arabia Felix. This tract did not admit of much cultivation, the greateſt part being covered with dry ſands, or riſing into rocks, interſperſed here and there with ſome fruitful ſpots. Its metropolis was Petra, which by the Syrians was ſtyled Rakum, and in

Scripture

Scripture Jokthéel. Several other cities of Arabia Petræa are mentioned by Ptolemy; but as it is very improbable such a barren country should abound with large cities, we must look upon them as inconsiderable places.

(5.) ARABIA, EARLIEST INHABITANTS OF.—At what time the abovementioned kingdoms were first peopled, we have no certain accounts. The most considerable nations inhabiting Arabia Petræa, in the early ages, were the Ishmaelites, the Nabatei or Nabatheans, the Cedræi or Kedareni, and the Agareni or Hagareni; and of these the Ishmaelites were the most powerful, if they did not comprehend all the rest; and if the Hagareni were not the same people with them, they must at least have been nearly related. Kimchi, an oriental historian, insinuates, that they were originally the children of Hagar by an Arab, after she had left Abraham. In after ages, the names of all the nations situated here, were absorbed in that of Saracens, by which the Ishmaelites are distinguished in the Jerusalem Targum. A nation also is mentioned by Pliny, called *Arraceni*, and *Saraceni* by Ptolemy and Dioscorides, which was probably no other than the Ishmaelites above mentioned. In Arabia Deserta several tribes resided, all of whom were very obscure, except the Aisitæ and Agræi. The former are supposed by Bochart to have been Job's countrymen, and the latter to have been the same with the Hagareni, Arraceni, or Saraceni, abovementioned. Arabia Felix was inhabited by many different tribes; the most remarkable of which were the Sabæi, Gerræi, Minæi, or Minnæi, Atramitæ, Maranitæ, Catabani, Asciræ, Homeritæ, Sapphoritæ, Omanitæ, Saraceni, Nabathæi, Thamydeni, and Bnizomenæ: but neither their limits nor situation can now be determined with any manner of precision. According to the oriental historians, the Arabs are divided into two classes; viz. the *old lost Arabians*, and the *present*. The most famous tribes among the former, were those of Ad, Thamud, Tasm, Jades, Jorham, Amalek, Amtem, Hasbem, Abdi, and Bar. Concerning these, though now entirely lost and swallowed up among other tribes, there are some remarkable traditions, of which the following may serve as a specimen.

(6.) ARABIA, FABULOUS TRADITIONS CONCERNING. The tribe of Ad deduced their origin from Ad the son of Aws, or Uz, the son of Aram, the son of Shem, who, after the confusion of tongues, settled in Al Ahkaf, or the winding sands in the province of Hadramaut, on the confines of Yaman, where his posterity greatly multiplied. Their first king was Sheddad, the son of Ad, who built a stately palace, and made a delightful garden in the deserts of Aden, which he designed as an imitation of the celestial paradise. This garden he called *Irem*: and when it was finished, he set out with a great retinue to take a view of it; but, having some thoughts of assuming divine honours, he was destroyed by a tempest from heaven, while yet a day's journey from his paradise. The garden and palace, however, were preserved, though invisible, as a monument of divine vengeance. After the death of Sheddad, the kingdom of Ad was governed by a long series of princes, concerning whom many fables are related by the eastern writers. The conclusion of their history, however, is as follows:—"The Adites, in process of time, falling from the worship of the true God, into idolatry, God sent the prophet Hud, supposed to be the same with Heber, to preach and to reclaim them.—But they refusing to acknowledge his mission, or to obey him, God sent an hot and suffocating wind, which blew seven nights and eight days, and, entering at their nostrils, passed through their bodies, and destroyed them all, a very few only excepted, who had listened to Hud, and retired with him to another place." Others relate, "that, before this terrible catastrophe, they had been previously chastised with a 3 years drought; and therefore sent Kail Ebn Ithar, and Morthed Ebn Sdaa, with 70 other principal men to Mecca, then in the hands of the tribe of Amalek, whose prince was Moawiyah Ebn Beer, to obtain of God some rain. Kail having begged of God that he would send rain to the people of Ad, 3 clouds appeared, a white, a red, and a black one; and a voice from heaven ordered him to choose which he would. Kail failed not to make choice of the last, thinking it would be laden with most rain; but when this cloud came over them, it proved to be fraught with the Divine vengeance, and a tempest broke forth from it, which destroyed them all."

(7.) ARABIA, GOVERNMENT OF. Of the government of Arabia, we cannot give a better general view, than in the words of Mr Niebuhr. (Vol. ii. p. 16, *et seq.*) "The most natural authority is that of a father over his family, as obedience is here founded upon the opinion of benevolence in the ruler. When the mournful survivors of the human race settled themselves anew, after the awful revolution by which the globe was, for a time, divested of its beauty, and depopulated; every family submitted readily to the guidance and direction of him to whom they owed their existence. As those families multiplied, the younger branches still retained some respect for the eldest branch. Of all the progeny, it was esteemed the nearest to the parent stem. And, although the subdivisions became more and more numerous, they still regarded themselves as composing but one body, in remembrance of their common origin. Such an assemblage of families, all sprung from the same stock, forms what we call a tribe. It was, in this manner, easy for the representative of the eldest branch to retain somewhat of the primary paternal authority over the whole tribe to which he belonged. Sometimes, when a family became too numerous, it divided from the rest with which it was connected, and formed a new tribe. Upon other occasions, when several tribes found themselves separately too weak to resist a common enemy, they would combine, and acknowledge one common chief. And sometimes it would happen, that a numerous tribe might force some others that were weaker, to unite themselves to, and become dependent upon it; but seldom has this dependence degenerated into slavish subjection. This primitive form of government, which has ever subsisted without alteration among the Arabs, proves the antiquity of this people, and renders their present

preſent ſtate more intereſting than it would otherwiſe be. Among the Bedouins it is preſerved in all its purity. In other parts of Arabia, it has ſuffered ſome changes, but yet is not materially altered. The Bedouins, or paſtoral Arabs, who live in tents, have many Schiechs, each of whom governs his family with power almoſt abſolute. All the Schiechs, however, who belong to the ſame tribe, acknowledge a common chief, who is called *Scheeh es Scheuch*, Schiech of Schiechs, or *Scheeh el Kbir*, and whoſe authority is limited by cuſtom. The dignity of Grand Schiech is hereditary in a certain family; but the inferior Schiechs, upon the death of a Grand Schiech, chooſe the ſucceſſor out of his family, without regard to age or lineal ſucceſſion, or any other conſideration, except ſuperiority of abilities.—This right of election, with their other privileges, obliges the Grand Schiech to treat the inferior Schiechs rather as aſſociates than as ſubjects, ſharing with them his ſovereign authority. The ſpirit of liberty, with which this warlike nation are animated, renders them incapable of ſervitude. This ſpirit is leſs ſenſibly felt among thoſe who live in towns, or are employed in huſbandry. It was eaſier to reduce them under ſubjection. In the fertile diſtricts of this country, there have always been monarchies, more or leſs extenſive, formed, either by conqueſt, or by religious prejudices. Such are the preſent dominions of the *Sherriffe of Mecca*, of the *Imams of Sana* and *Maſkat*, and of ſome princes in the provinces of Hadramaut. However, as theſe countries are interſected by large ranges of mountains, the mountains are occupied by independent Schiechs. But, although ſo many independent chieftains have their domains interſperſed through the territories of thoſe ſeveral ſovereigns, yet nothing of the feudal form of government appears here.—The Schiechs poſſeſs no fiefs; they have only a ſort of property in the perſons of the people of their ſeveral tribes. Even thoſe who ſeem to be tributary ſubjects to the princes within whoſe dominions they dwell, are not actually ſo. They remain independent; and the tribute which they pay is nothing but a tithe for the uſe of the land of which they are in ſome ſort farmers. Such are the Schiechs ſettled in Syria, Egypt, and over all Mount Atlas.—A nation of this character cannot readily ſink into a ſervile ſubjection to arbitrary power. Deſpotiſm would never have been known, even in the ſlighteſt degree, in Arabia, had it not been for theocracy, the uſual ſource of it. The Imams being reputed ſucceſſors of Mahomet, and his deſcendants, and being acknowledged both as temporal and ſpiritual heads within their dominions, have thus found means to abuſe the ſimplicity of their ſubjects, and to enlarge their authority. Nevertheleſs, the genius of the people, their cuſtoms, and even their religion, are all inimical to the progreſs of deſpotiſm, and concur to check the Imams in the exerciſe of their power. The idea of forming republican government ſeems never to have occurred to the Arabians. This form is not a neceſſary conſequence of the primitive condition of mankind. It muſt have originated among people whoſe patience was exhauſted by the outrages of arbitrary power; or ſometimes, perhaps, from the fortuitous concourſe of perſons not connected by the ties of family relation. The united ſtates of Haſchidu Bekil are not ſo much a federative republic, as an aſſociation of ſeveral petty princes, for the purpoſe of mutual defence againſt their common enemies. Their government reſembles that of the German empire, not the States of Switzerland, or the United Provinces. Concerning the pretended Republic of Brava, upon the eaſtern coaſt of Africa, little certain is known. There is ground for thinking that it likewiſe is merely a confederation among the Arabian Schiechs in that country. The colony of Jews, who occupy a diſtrict in the province of Hedjas, are governed by a hereditary independent Schiech. Having been for ages divided from their countrymen, they have adopted that form of government which they ſaw prevalent among their immediate neighbours. This multiplicity of petty ſovereigns occaſions ſeveral inconveniences to the people in general. Wars cannot but frequently ariſe among ſtates whoſe territories are ſo intermingled together, and whoſe ſovereigns have ſuch a variety of jarring intereſts to manage. But, happily, theſe quarrels are ſcarcely ever productive of very fatal conſequences. An army of a thouſand Arabs will take to flight, and think themſelves routed, if they loſe but ſeven or eight of their number. Thus are theſe conteſts terminated as eaſily as excited. No doubt, ſuch a multitude of noble and petty princes, whoſe numbers are continually increaſed by polygamy, muſt have an unfavourable influence upon the general happineſs of the people. It ſtrikes one with ſurpriſe, to ſee the Arabs, in a country ſo rich and fertile, uncomfortably lodged, indifferently fed, ill clothed, and deſtitute of almoſt all the conveniencies of life. But the cauſes fully account for the effects. The poverty of the wandering Arabs is plainly voluntary. They prefer liberty to wealth, paſtoral ſimplicity to a life of conſtraint and toil, which might procure them a greater variety of gratifications. Thoſe living in cities, or employed in the cultivation of the land, are kept in poverty, by the exorbitancy of the taxes exacted from them. The whole ſubſtance of the people is conſumed in the ſupport of their numerous princes and prieſts. The huſbandmen cannot bear ſuch exceſſive impoſts without being reduced to miſery. One general cauſe of the impoveriſhment of Arabia is, no doubt, its having ceaſed to be the channel of the trade with India, ſince the diſcovery of the paſſage by the Cape of Good Hope. Yet, if the lands were better cultivated, this country might, without the aid of foreign trade, afford ſufficient reſources to ſupply all its inhabitants with abundance of the neceſſaries and common conveniencies of life."

(8.) ARABIA, HISTORY OF. The preſent Arabs, according to their own hiſtorians, are ſprung from Kahtan, the ſame with Joktan, the ſon of Eber; and Adnan, deſcended in a direct line from Iſhmael the ſon of Abraham. The former of theſe they call the *genuine* or *pure* Arabs, and the latter the *naturalized* or *inſititious* Arabs. Joktan the ſon of Eber had 13 ſons, who ſome time after the confuſion

confuſion of languages ſettled in Arabia; extending themſelves from Meſha to Sephar, a mountainous place in the ſouth eaſtern part of that peninſula. According to the Arabian hiſtorians, he had 31 ſons, all of whom left Arabia and went into India, except two, viz. Yarab and Jorham; the former of whom, they ſay, gave the name both to their country and language. Iſhmael and his mother Hagar having been diſmiſſed by Abraham, entered into the wilderneſs of Paran, as related in the book of Geneſis. The ſacred hiſtorian informs us, that during his reſidence in the wilderneſs he married an Egyptian; and the Arabian writers ſay that he alſo took to wife the daughter of Modad king of Hejaz, lineally deſcended from Jorham the founder of that kingdom. By the Egyptian he was probably the father of the Scenite or wild Arabs; and having allied himſelf to the Jorhamites, he is conſidered by the Arabians as the father of the greateſt part of their nation. Kahtan, or Joktan, is ſaid to have firſt reigned, and worn a diadem in Yaman: but the particulars of his reign we no where learn. He was ſucceeded by Yarab already mentioned, he by Yaſhab, and Yaſhab by Abd Shems. He was wonderfully ſucceſsful in his expeditions againſt his enemies, carried off great ſpoils, and took many of them priſoners. He is ſaid to have built the city of Saba or Mareb, and above it a ſtupendous mound or building which formed a vaſt reſervoir, containing all the water that came down from the mountains. By means of this reſervoir the kings of Yaman not only ſupplied the inhabitants of Saba and their lands with water, but likewiſe kept the territories they had ſubdued in greater awe, as by cutting off their communication with it they could at any time greatly diſtreſs them. Abd Shems was ſucceeded by his ſon Hamyar, from whom the tribe of Hamyar is ſaid to take its name; and he by a ſeries of 17 kings, concerning whom we have no remarkable particular, except that from one of them called *Africus* the continent of Africa took its name. The laſt of theſe was ſucceeded by a daughter named *Balkis* or *Belkis*, whom ſome will have to be the queen of Sheba, who paid a viſit to Solomon. After Balkis came Malea, ſurnamed *Naſherolneam* on account of his magnificence and liberality. Having had bad ſucceſs in an expedition, where his army was overwhelmed by torrents of ſand, he cauſed a braſen ſtatue to be erected with the following inſcription in the old Hamyaritic character. "There is no paſſage behind me, no moving farther; the ſon of Sharhabil." He was ſucceeded by Shamar Yaraſh, ſo called on account of his being affected with a conſtant tremor. To this prince the city of Samarcand is ſaid to owe its exiſtence. After Shamar Yaraaſh, we have a liſt of 15 kings, of whom nothing worth mentioning is recorded, except one Abu Carb Aſaad, who adorned the Caaba or temple of Mecca with tapeſtry, and firſt introduced Judaiſm among the Hamyarites. He was put to death by his ſubjects, probably on account of religion. The laſt of the 15 kings above mentioned was called *Abrahah*, who was ſucceeded by his ſon Sabban. He had that famous ſword called *Samſannah*, which afterwards came into the hands of the khalif Al Raſhid. This prince was ſucceeded by Dhu Shanater, who had ſix fingers on each hand. He was abandoned to unnatural luſt, and dethroned for abuſing ſome of the nobleſt youths in the kingdom. To him ſucceeded Yuſef, who lived about 70 years before Mahomet. He perſecuted all thoſe who would not turn Jews, putting them to death by various tortures, the moſt common of which was throwing them into a glowing pit of fire; whence he had the appellation of the *lord of the pit*. This perſecution is taken notice of in the Koran. The laſt of the Hamyaritic monarchs was Dhu Jadan, according to Abulfeda; but, according to others, the Yuſef juſt mentioned, who was ſurnamed *Dhu Nowas* on account of his flowing curls, and was the laſt who reigned in an uninterrupted ſucceſſion. He was a bigotted Jew, as already mentioned; and treated his ſubjects with ſuch barbarity, that they were obliged to aſk the aſſiſtance of Eleſbaas or Eleſbaan, king of Ethiopia, againſt him. Dhu Nowas, not being able to make head againſt the Ethiopians, was at laſt driven to ſuch extremity, that he forced his horſe into the ſea, and loſt both his life and crown together. The king of Ethiopia, having thus become maſter of Yaman, eſtabliſhed there the Chriſtian religion, and fixed upon the throne one Abryat, an Ethiopian. Of this event, however, Mr Niebuhr expreſſes ſome doubts. Abryat was ſucceeded by Abraha-Ebn-Al-Sabah, ſurnamed the *ſlit noſed*, from a wound he had formerly received in it. He was likewiſe ſtyled *lord of the Elephant*, from a ſtory too ridiculous to deſerve notice. He was ſucceeded by two other Ethiopian princes; but at laſt Seif Ebn Dhu Yanan, of the old royal family of Hamyar, having obtained aſſiſtance from the king of Perſia which had been denied him by the emperor Heraclius, recovered his throne, and drove out the Ethiopians; but was himſelf ſlain by ſome of them who were left behind. The ſucceeding princes were appointed by the Perſians, till Yaman fell into the hands of Mahomet. We have already taken notice of the vaſt mound or reſervoir made by Abd Shems, from which he ſupplied the city of Saba with water. This building ſtood like a mountain above the city, and was by the Sabæans eſteemed ſo ſtrong, that they were under no fear of its ever failing. The water roſe almoſt to the height of 20 fathoms; and was kept in on every ſide by a work ſo ſolid, that many of the inhabitants had their houſes upon it. About the time of Alexander the Great, however, a terrible inundation happened. According to the Arabian hiſtorians, God being diſpleaſed at the pride and inſolence of the inhabitants of this city, reſolved to humble them; and for this purpoſe ſent a mighty flood, which broke down the mound by night while the inhabitants were aſleep, and carried away the whole city with the neighbouring towns and people. This inundation is ſtyled in the Koran the *inundation of Al-Haram*; and occaſioned ſo terrible a deſtruction, that from thence it became a proverbial ſaying to expreſs a total diſperſion, "that they were gone and ſcattered like Saba."—By this accident no leſs than eight tribes were forced to remove their habitations; ſome of which gave riſe to the kingdoms of Hira and Ghaſſan. The kingdom of Hira was found-

was founded by Malec, a defcendant of Cachlan the brother of Himyar; but after three defcents, the throne came by marriage to the Lakhmians, who were defcendants of Lakhm the fon of Amru, the fon of Abd Ems. Thefe princes, whofe general name was *Mondir*, preferved their dominion, notwithftanding fome fmall interruption from the Perfians, till the khalifat of Abubeer, when Al Mondar Mughrur, the laft of them, loft his life and crown by the arms of Khaled-Ebn-Al-Walid. This kingdom continued 622 years and eight months, according to Achmet Eba Yufef. Its princes were under the protection of the kings of Perfia, and were there lieutenants over the Arabs of Irak, as the kings of Ghaffan were for the Roman emperors over thofe of Syria. The kingdom of Ghaffan was founded by the tribe of Azd, who, according to fome, fettling in Syria Damafcena, near a water called *Ghaffan*, from thence took their name; but others fay they went under this appellation before they left Yaman. Having driven out the Dajamian Arabs, who before poffeffed the country, they made themfelves maflers of a conliderable territory. Here they maintained themfelves, according to fome 400, according to others 600, and according to Abulfeda 613 years, when the laft of their kings fubmitted to the khalif Omar, and embraced the Mahometan religion; but receiving afterwards a diftaft, foon returned to Chriftianity, and took refuge in Conftantinople. The kingdom of Hejaz was founded by Jorham the fon of Kahtan, where princes of his line reigned till the time of Ifhmael, who married the daughter of Modad one of thofe princes. Some authors relate that Kidar, one of Ifhmael's fons, had the crown refigned to him by his uncles the Jorhamites; but, according to others, the defcendants of Ifhmael expelled that tribe; who, retiring to Johamah, were, after various adventures, deftroyed by an inundation. After the expulfion of the Jorhamites, the government of Hejaz feems not to have continued long in the hands of one prince, but to have been divided among the heads of tribes, almoft in the fame manner as the Arabs of the defert are governed at this day. The tribe of Kozaib, after the above mentioned inundation, of Saba, fled into the kingdom of Hejaz, and fettled themfelves in a valley called *Marri* near Mecca. Here they founded an ariftocracy, aflfuming to themfelves both the government of Mecca, and the cuftody of the Caaba or temple there. They continued maflers of this city and territory, as well as prefidents of the Caaba, for many ages; till at length one Kofa, of the tribe of Koreifh, circumvented Abu Gabfham, a weak man, of whom, while in a drunken humour, he bought the keys of the temple for a bottle of wine; but when Abu Gabfhan grew cool, and reflected on his imprudence, he repented of what he had done; whence the Arabian proverbs, "More vexed with late repentance than Abu Gabfhan; More fooliih than Abu Gabfhan," &c. The tribe of Khozaab endeavoured afterwards to give fome diflurbance to the Koreifh in the poffeffion of the keys of the Caaba, which furnifhed the latter with a pretence for depriving them of the civil government of Mecca. After the Koreifh had poffeffed themfelves of this city, they kept up the fame form of government which had prevailed there before. Befides thefe kingdoms, there were many others of inferior note, of which we find nothing remarkable. Thefe are the moft memorable events recorded by the Arabian hiftorians previous to the time of Mahomet, of whofe fuccefsful impoflure the reader will find a particular account elfewhere. See MAHOMET. We cannot clofe this fection, however, without another fhort quotation from Mr Neibuhr, who fays, that "in the earlieft period of the hiftory of this country, it was governed by potent monarchs, called *Tobba*—a title thought to have been common to all thofe princes, as the name of Pharaoh was to the ancient fovereigns of Egypt. There exifts, (he adds) a pretty diftinct tradition among the learned Arabs, with refpect to thofe ancient kings. They pretend to know, from ancient monuments, that Tobba was the family name of thofe fovereigns, that they came from the neighbourhood of Samarcand, were worfhippers of fire, and conquered and civilized Arabia. This tradition accords with the plaufible hypothefis of an ingenious writer." (M. Bailli, late mayor of Paris) "who derives the knowledge and civilization of the people of the fouth, from a nation who once flourifhed in that part of Tartary in which Samarcand is fituated." Mr Niebuhr confirms this idea, by mentioning an infeription he had feen in Arabia, in ftrange characters, which he afterwards found to be the fame with thofe of fome inferiptions at Perfepolis. To which he adds, "A tradition prevails through Perfia, that the conqueror who founded Perfepolis, was originally from the vicinity of Samarcand; fo that both the Arabians and the Perfians would appear to have had fovereigns from the fame nation, who fpoke the fame language, or at leaft employed the fame characters in writing."

(9.) ARABIA, MODERN HISTORY OF. The chief, or almoft the only part of the modern hiftory of Arabia, with which we are acquainted, is that of Mahomet, and his fucceffors the *khalifs*, or *vicars*, as the word in Arabic fignifies. The principal oppofition made to Mahomet's impoflure was by the tribe of the Koreifh, who leagued againft him, and perfecuted him and his followers. His flight from Mecca to Medina, during which he was twice in the moft imminent danger of falling into their hands, was confidered as fo miraculous by his followers, that it has ever fince been held as the Mahometan Æra; the word *Hegira* being the Arabic for *flight*. This happened A. D. 622. Soon after, his followers increafed fo rapidly that he was enabled to face his enemies in battle with fuccefs; and partly by force, partly by fraud, as well as by perfuafions and alliances, at laft brought a great part of his countrymen to embrace his new fyftem, and to confider him as their prophet and fovereign. Mr Neibuhr fpeaks of this "revolution, which Mahomet effected in the religion and the political ftate of his country, as having involved in it more important conlequences" than any other that ever took place in Arabia. "This fortunate ufurper, (he adds,) with the arms of his countrymen, fpread his conquefts over diftant regions. His fucceffors, for a while, profecuted the career of conqueft with the fame fuccefs. But neither he, nor the khalifs, could ever

ever entirely subdue their own nation. Many chiefs, in the interior parts of the country, still maintained their independence, without respecting the khalif in any other light than as the head of their religion. The authority of the khalifs was merely spiritual, except in their dominions over a part of the coast, where they were acknowledged as sovereigns." But, as Mr Heron, his translator, justly observes in a note, "perhaps the khalifs might have been more successful in subjugating their fellow countrymen, if Syria, India, Egypt, and Spain, had not presented more inviting scenes of conquest and of empire." The history of Mahomet's successors, therefore, being rather local, than relating to the general history of Arabia, will be found under the article KHALIFS; and we shall conclude this section in the words of Mr Neibuhr: "After the ruin of the power of the khalifate by the Turks, Arabia shook off the yoke to which it had been in part subjected, and came to be governed, as formerly, by a number of chiefs, more or less powerful, descended from different indigenous families. No neighbouring power ever attempted to subdue this country, till the Portuguese penetrated to India, and made their appearance in the Red Sea. Then, in the beginning of the 16th century, sultan EL GURY, desirous to rid himself of those new comers, whom he viewed as dangerous, fitted out a fleet to expel the Portuguese. That fleet, availing themselves of the opportunity, seized almost all the sea-port towns of Arabia. But, when the dynasty of the Mammalukes was terminated by the Turks, these cities fell again into the hands of their natural sovereigns. The Turks continued the war with the Portuguese, in order to secure Egypt, their new conquest. Soliman Pacha, at the head of a powerful fleet, after the example of the late sultan of the Mammalukes, seized all the towns upon the Arabic Gulph. His successors pushed their conquests still farther, and subdued great part of Yemen, penetrating backwards to the Highlands; so that Arabia became almost entirely a province of the sultan of Constantinople, and was governed by pachas, like the other provinces of the Ottoman empire. In the interior parts, however, there still were independent princes and schiechs, who had never been subdued, but continued to harass the Turks, and to drive them towards the coasts. After various reiterated efforts, a prince of the family now reigning at Sana, at length succeeded, about the middle of the last century, and obliged the Turkish nation to evacuate all the places upon the Arabian coast, which they had occupied for more than a century. The Turks now possess nothing in this country, but a precarious authority in the city of Jidda: And it is therefore absurd to reckon Arabia among the Ottoman provinces, since it is properly to be considered as independent of all foreign powers. A people who, like the Arabs, have so long detached themselves from the rest of the world, cannot undergo any very important revolutions, that may deserve to be commemorated in history. The events which take place among them are only petty wars and trifling conquests, worthy of their poor chiefs, and narrow divisions of territory."

(10.) ARABIA, PECULIAR PLANTS OF. "The indigenous plants of Arabia have been hitherto so little known, that Mr Forskal (one of the 4 gentlemen who accompanied Mr Neibuhr, in his travels, and who all died before his return) was obliged to form 30 new genera; not to speak of the doubtful species, which he durst hardly arrange under any known genera. Of the 800 plants (says Mr Neibuhr) described by my late friend, I shall content myself with speaking of a small number, remarkable for their novelty or utility. The first place is, no doubt, due to those which are used for food. The Arabians cultivate wheat, barley, and durra, (the *Holcus Linnæi*). The latter grain, *forgo*, or great millet, seems to be a native of Arabia, for several wild species of it are here to be found, on which the birds feed. That which is cultivated, in order to attain full maturity, requires considerable warmth, and upon a good soil grows to a great height. The Arabians cultivate several pot herbs, of the same nature as ours; such as lettuces, spinnach, carrots, a very delicate sort of purslain with sharp leaves; a sort of raddish, of which only the leaves are eaten; water cresses; and above all, great variety of gourds, cucumbers, pumpkins, and melons. Of pumpkins and melons, several sorts grow naturally in the woods, and serve for feeding camels. But the proper melons are planted in the fields, where a great variety of them is to be found, and in such abundance, that the Arabians of all ranks use them, for some part of the year, as their principal article of food. They afford a very agreeable liquor. When the fruit is nearly ripe, a hole is pierced into the pulp; this hole is then stopped with wax, and the melon left upon the stalk; within a few days the pulp is, in consequence of this process, converted into a delicious liquor. The pot herbs which are natives of India, but are now cultivated or naturalized in Arabia, are,—*Sida*, resembling our mallows; *Hibiscus*, resembling mallows also, but of which only one species is proper to be eaten, *Jussiæa*, nearly like the *Lysimachia*; *Acanthus*, a beautiful species; and *Bunias*, somewhat like our cabbages; the leaves of these plants are boiled. There are other Indian plants whose leaves the Arabians eat raw, and by way of sallad, such as *Cleome*, not unlike mustard; *Statice*; and *Dolichos*, a sort of bean. There are also some leguminous vegetables peculiar to the country, which require no culture. Such are *Cardesus*, and the plant like our mallows; *Salantium*, a new plant like the *Salix Calaf*, the leaves of which, when boiled, have a pleasing acid taste; lastly, the celebrated *Coloeasia*, (*Arum Colocasia Linn.*), of which the Egyptians have always made great use, and which grows in abundance in all marshy places in Arabia. The odoriferous herbs, of which we have also species, are lavender, marorum, the lily, and some pinks. But, the most fragrant, and those which produce the finest flowers, are plants common to Arabia and India. Those valued for their perfume are *Ocymum*, the most beautiful species of the basilic; *Inula*, a very odoriferous sort of elicampane, a native of India; *Cacalia*, from the heart of Africa; and *Dictamnus*, a plant as yet but little known, of which Mr Forskal discovered 8 species. In the sandy deserts grows a plant of a new genus, named

named MOSCHARIA, by my friend, on account of its musky smell. The plants of Indian origin which afford the first flowers, are, *Ipamœa*, a plant like the rope-weed; *Pancraticum*, called by us the sea-daffodil, a flower of the purest white colour; and *Hibiscus*, a species different from the leguminous *Hibiscus*, a flower of the brightest red colour, and singularly large. Various Arabian plants are used as materials for the arts, and for purposes of economy. An ill looking herb, like orache, and which Mr Forskal ranked as a distinct genus, by the name of SUÆDA, affords abundance of an alkaline salt, excellent for whitening linen, and used by the common people, instead of soap, which is very dear in Arabia. Of a particular sort of rush, the Arabians work carpets so fine, that the exportation of them to other countries, and even as far as to Constantinople, forms a considerable branch of trade to the people who live on the borders of the Red Sea. Two plants, natives of India, and of the interior parts of Africa, which have become very common in Arabia, namely, *Dolichos* and *Glycyne*, and resembling French beans, produce such beautiful beans, that they are strung into necklaces and bracelets, which are highly esteemed. The bean of the *Glycyne* is generally known by the name of the black bean of Abyssinia. The indigo-shrub (*Indigofera Linn.*) is cultivated through all Arabia, blue being the favourite colour of the Arabians. Several wild species of this plant grow very generally over the country. We were told, that, in a scarcity of this plant, the Arabians knew how to extract indigo from a species of *polygala*. The common *kali* (*salsola Linn.*) grows in great plenty along the Arabic Gulph, and in the isles. Were the Arabians capable of industry, they might make sugar for themselves, as the cane grows in their country in its full perfection; they content themselves with eating it raw, without even squeezing out the juice. Through almost all Arabia, a sort of *panus* (*panicum Linn.*) or bulrush (*scirpus Linn.*) is used for covering the roofs of houses. These slender coverings are sufficient in countries where rains are unfrequent. One plant, although not a native of Arabia, merits notice in this place, on account of the discovery made by Mr Forskal of an economical secret among the Arabians in Egypt, in which it is concerned. That country, in which the water is generally bad, has, from time immemorial, used for drinking a sort of beer different in its nature from that used in the north. They told us that they could neither brew this beer, nor give it an agreeable taste, without the use of a grey herb, called *schæbe*, an infusion of which was mixed with a certain quantity of meal, in order to form leaven for the fermentation both of bread and of beer. Upon seeing a specimen of that herb, we perceived it to be the *lichen* of the plum-tree, a native of the isles of the Archipelago, whence several ship ladings of it are annually brought to Alexandria. Meadows are rare, and not rich in hot countries; in Arabia, therefore, there are not many plants for forage. Camels eat of a species of *euphorbia*, after it had received some little preparation in a hole dug in the earth. This animal also browses on the dry and prickly herbs and bushes of the desart, such as the *zygophyllum*, *hedysarum*, *colutea*, &c. The *mesembryanthema*, succulent herbs, afford another resource to the animals of these widely extended sandy plains. The Bedouins likewise prepare, of the grain of a species of *mesembryanthemum*, a sort of bread, which they eat as readily as wheat bread. The ass eats a species of *scorsonere*, so rough and bitter that even the camel refuses it. All simple nations use for remedies vegetables, of the virtues of which they have a traditionary knowledge. The Arabians have also medicines of this kind, which they have used from time immemorial, with a degree of success of which indeed a stranger can never be absolutely certain. The different species of euphorbia are so numerous, that Arabia may certainly be regarded as its native country. In hot countries counterpoisons are highly esteemed, on account of the numbers of venomous beasts with which such countries are infested. By long experience, the inhabitants of those countries have learned what plants are salutary to man, and noxious to the venomous animals. The Arabians, however, appear to be ignorant of the virtues of the *ophiorrhiza*, which is very common on their hills. But they value highly the *aristolochia semper virens*, which they consider not only as a remedy, but as a preservative too, against the bite of serpents. In their opinion, a man who, for 40 days, drinks the decoction of this herb, is in no future danger of being bitten by those venomous animals. Although the grounds of this opinion do not fully appear, yet it seems probable, that the jugglers, who expose themselves so daringly to be bitten by serpents, have some secret by which they preserve themselves from suffering by their bites. The prickly caper-tree is also esteemed an excellent antidote against poisons of all kinds. Among the new genera of plants discovered by Mr Forskal, several are particularly curious. *Caydbeja*, called by Sir Charles Linnæus FORSKALEA, in honour of my deceased friend, grows in the driest places of the country. It has small feelers, with which it fixes itself so tenaciously upon stuffs and other smooth bodies, that it is torn in pieces before it can be removed. The VOLUTELLA is a very extraordinary plant; being properly a long slender thread, without root or leaves, which entwines itself about trees. It bears, however, a sort of flower, and berries, which are eaten by children. The POLYCEPHALOS, which resembles the thistle, has at a distance the appearance of a loose heap of balls, each of which incloses a parcel of flowers. The *Nerium obesum*, a sort of laurel rose, is remarkable for a singular bulb, close to the earth, and of the size of a man's head, which forms all its trunk, and out of which the branches spring. Reeds are so common about the Arabic Gulph, as to have procured the Gulph the name of *Jam Suf*, or the sea of reeds from the ancients. One species of this vegetable is particularly worthy of notice. It grows with a vigorous vegetation, and in great abundance, in the bath waters, in the district of *Ghobeybe*, where it rises to the height of 24 feet. These long solid reeds are an article of commerce. They are exported to Yemen, and there used in the ceiling of houses. In the same district of *Ghobeybe*, nearly opposite to Suez, we were surprised to see a *Conferva* growing in the

bottom of the hot baths *Hammam Faraon*, the heat of which was at 49 degrees in Reaumur's thermometer."

[11.) ARABIA, QUADRUPEDS, BIRDS, INSECTS, &c. OF. Mr Neibuhr describes the domestic animals of Arabia, as "retaining their primary instincts in higher perfection, and as more eminently distinguished by strength and beauty here than elsewhere. Such are the horse, the ass, the camel, and perhaps too the ox. The camel, by its power of enduring thirst, and its containing a reservoir for water in its bowels, seems naturally destined for an inhabitant of the desart. Its hoof is formed to tread on burning sands; and the cartilaginous texture of its mouth enables it to feed on the hard and prickly plants of those parched plains. The ass, especially, seems to be a native of Arabia. Here are a species of asses, which, in beauty, vigour, and spirit, are no contemptible rivals to the horse. The inhabitants speak likewise of a wild animal, called DJAFAR, of the same size and shape as the ass, the flesh of which is excellent food. They speak of another animal of the form of an ox, which is destitute of horns, and feeds only by night. On the lofty hills of Arabia Petræa, are rock goats. The plains are stocked with GAZELLES; and this beautiful creature is so common, that the Arabian poets draw from it many of their allusions and similitudes. In the sandy tracts are numbers of those little animals called JERBOAS, or Pharaoh's rats, (and by naturalists *Mus Jaculus*,) whose flesh the Arabians eat without any dislike. In the forests, in the south of Arabia, are monkies without tails, whose back parts are bare and red. I saw these animals in troops of some hundreds. Other travellers have met with them in thousands on the hills of Aden. These creatures are docile, and easily learn any trick. On this account numbers of them are exported to Egypt, where jugglers exhibit them to the people. Of carnivorous animals, the most hideous and formidable is the hyæna, who attacks men and beasts with the same ferocity. This fierce and solitary animal inhabits the caverns of the desart mountains of Arabia Petræa, and is also common round the shores of the Persian Gulph. The hyæna marches out only at night, in that season when the inhabitants of the country sleep in the open air, and often carries off children from beside their parents. As the domestic animals on the southern coast of the Persian Gulph are chiefly fed upon fishes, the hyæna is sometimes obliged to content himself with the same food. The leopard, reckoned by Mr Forskal among the carnivorous animals, is perhaps the same as the panther, *(Felis pardus Linnæi)*; the more probably so, as he gives it the Arabic name of the panther, *Nemer*. However, the ounce or small panther, named in Arabic *Fatk*, is still more common than the large one; neither is it regarded with any sort of terror in Arabia, where it carries away cats and dogs, but never ventures to attack men. Wild boars, wolves, and foxes are found in Arabia: but the most common carnivorous animal is a sort of wild dog, more like the fox than the household dog, and named by the Turks *Tschakal*, by the Arabians *El Vaui*. In the fertile countries of Arabia, tame fowls are very plentiful, and all sorts of poultry are bred in great abundance. The pintado is not domestic; but these birds inhabit the woods in such number, that children kill them with stones, and then collect them to be sold in the towns. The pheasant is likewise a native of Arabia, and is found in great plenty in the forests of Yemen, as well as the wood-pigeon, and several other varieties of the pigeon species. In the plains of the same province, the grey partridge, the common lark, and a sort of white crane, having the under part of the belly of a beautiful red, are also to be seen here. So dry a country as Arabia cannot be supposed to afford a great variety of water fowls. However, in places where there was water, we found a beautiful variety of the plover, and sometimes flocks. Sea fowls, which live upon fish, are numerous on the coasts of the Red Sea, because this gulph is very deep, and copiously stored with fishes. Beside some sorts of sea-maws, we saw in an isle of the Red Sea pelicans, who had built nests and laid eggs as large as those of the goose. The deserts of Arabia are not without ostriches, which are called by the inhabitants *Thar Edsjammel*, the camel bird. A beautiful lapwing, called by the Arabians HUDHUD, is also common on the shores of the Persian Gulph. Some Arabians have been persuaded, by a fabulous tradition, that the language of this bird may be understood! Eagles, falcons, sparrow-hawks, and the Egyptian vulture, *(Vultur Percnopterus Linnæi.)* are birds of prey to be met with in Arabia. The last of these is very serviceable in the country; clearing the earth of all carcases, which corrupt very rapidly, and are very noisome in hot countries. He also destroys the field mice, which multiply so prodigiously in some provinces, that, were it not for this assistance, the peasant might cease from the culture of the fields as absolutely vain. The performance of these important services induced the ancient Egyptians to pay those birds divine honours; and even at present it is held unlawful to kill them, in all the countries which they frequent. There is another bird, not less beneficial to the inhabitants. It is thought to be a native of Korasan, for it comes annually into Arabia, in pursuit of the swarms of locusts, of which it destroys incredible numbers. It is called *Samaman* or *Samarmog*. Mr Forskal ranks it among the thrushes, and calls it *Turdus Sturnus*. The services done by this bird, in countries exposed to the ravages of those insects, have given rise to several ridiculous and superstitious practices in Syria. It is thought to be attracted from Arabia by water, which is, for this end, brought from a distance with great ceremony, and preserved in a stone reservoir on the top of the tower of a mosque. When this water fails, the inhabitants of Mosul are in despair. But as the bird's instincts prompt it not only to feed on locusts, but to kill as many of them as possible, it naturally follows these insects in the course of their passage. The *Saree* is a bird of passage which frequents a small district in Arabia. The *Arjoon* is famous for two beautiful feathers, with which the Highlanders adorn their bonnets, and to preserve which uninjured, the bird, it seems, leaves a hole in its nest. The *Thaer el Hind*, rare and remarkable for its gilded plumage, is sold very dear in

Arabia.

Arabia. In Arabia, the land-tortoiſe is common; the peaſants bring them by cart-loads, to the markets of ſeveral towns in the eaſt. The eaſtern Chriſtians eat theſe animals in lent, and drink their blood with great reliſh. We ſaw ſeveral ſorts of lizards, of which the only dangerous one was that called by the Egyptians GECKO. It is ſaid that the ſaliva of this creature, falling upon victuals, infects the perſons who eat them with the leproſy. There are in Arabia ſeveral ſorts of ſerpents, the bite of which is often mortal. But the innocent are as numerous as the dangerous ſerpents. Of ſome the bite occaſions only a diſagreeable itching, which the Arabians cure by applying the leaves of the caper tree to the wound. In general, life is endangered only by the bite of ſuch ſerpents as have a diſtinct row of teeth larger than the reſt of the teeth. The Arabians in Egypt are acquainted with this law in the ſtructure of reptiles, and play ſafely with ſerpents, after pulling out the long teeth, which ſerve to conduct the poiſon. In Arabia, the only ſerpent that is truly formidable is that called Baetan, a ſmall ſlender creature, ſpotted black and white; its bite is inſtant death, and the dead body is ſwelled by the poiſon in a very extraordinary manner. Mr Forſkal diſcovered in the Red Sea ſeveral ſorts of ray fiſhes which are unknown in Europe. That ſea is in general ſtored with a great variety of fiſhes; and in the ſhort paſſage between Suez and Jidda, he obſerved more than 100 new ſpecies, only a part of which he could rank among the known genera. He was obliged to form 4 new genera, which he named *Salaria*, *Scarus*, *Signanus*, and *Acanthurus*. A new torpedo which he met with, appeared ſo different from that already known, that he was induced to claſs it as a particular genus. Among the new ſpecies are ſome belonging to genera which are found alſo in our ſeas; ſuch are ſeveral cod-fiſhes hitherto unknown; new ſpecies of mackerels, mullets, ſcari, perches, &c. Others of theſe ſpecies belong to genera peculiar to the ſeas adjacent to countries, ſuch as the *Chætodon* and the *Sciæna*. In our paſſage over the Red Sea, we ſaw troops of flying fiſhes, which roſe from time to time above the ſurface of the water; but we diſcovered no flying ſerpent in the courſe of our voyage; although the Arabians give this name to a ſerpent which ſhould rather be called the leaper. This ſerpent fixes himſelf by the tail to a low branch of a tree, and then giving himſelf an impetus, by means of his elaſtic tail, ſprings from branch to branch ſucceſſively, till he reaches the top. The locuſts have a great influence on the condition of the inhabitants of Arabia, and of ſeveral other countries in the eaſt. Mr Forſkal calls the locuſt which infeſts Arabia, *Gryllus Gregarius*, and thinks it different from that which is called by Linnæus *Gryllus Migratorius*, and which is a native of the deſarts of Tartary, from which it paſſes through the neighbouring countries, into Poland and Germany. The Gryllus Gregarius merits this denomination, for the locuſts of this ſpecies appear to [illegible] and to live and travel in ſociety. [illegible] remain after the departure of the [illegible] irregular ſtragglers. The A[illegible] ſeveral ſeparate ſpecies of this [illegible] five particular names. But theſe names are not expreſſive of any qualities in the nature of the animal; as they reſpect only the delicacy aſcribed to its fleſh. They give the name *Muken* to the red locuſt, which is eſteemed fatter and more ſucculent than any of the others; they likewiſe eat the light locuſt; but abſtain from another, called *Dulbe*, becauſe it has a tendency to produce diarrhœa. All Arabians, whether living in their native country, or in Perſia, Syria, and Africa, are accuſtomed to eat locuſts. The Turks, on the contrary, have an averſion for this ſort of food. If the Europeans expreſs any thing of the ſame averſion, the Arabians then remind us of our fondneſs for oyſters, crabs, and lobſters. A German, who had long reſided in Barbary, aſſured us, that the fleſh of this inſect taſted like the ſmall ſardine of the Baltic Sea, which is dried in ſome towns of Holſtein. We ſaw locuſts caught, and put into bags, or on ſtrings, to be dried, in ſeveral parts of Arabia. In Barbary, they are boiled, and then dried upon the roofs of the houſes. The Bedouins of Egypt roaſt them alive, and devour them with the utmoſt voracity. We ſaw no inſtance of unwholeſomeneſs in this article of food; Mr Forſkal was indeed told, that it had a tendency to thicken the blood, and to bring on melancholy habits. The Jews in Arabia are convinced, that the fowls, of which the Iſraelites ate ſo largely in the deſart, were only clouds of locuſts,—and laugh at our tranſlators, who have ſuppoſed that they found quails where quails never were. The ſwarms of theſe inſects darken the air, and appear at a diſtance like clouds of ſmoke. The noiſe they make in flying is frightful and ſtunning, like that of a water-fall. When ſuch a ſwarm falls upon a field, it is waſted and deſpoiled of its verdure. The pulſe and date trees ſuffer greatly from the locuſts; but corn, either ripe or nearly ſo, is too hard for their uſe, and they are obliged to ſpare it. A ſmall inſect named ARDA, of the bulk of a grain of barley (*Termes fatale*, *Linn.*) is another ſcourge of Arabia, and of hot countries in general. On account of ſome general reſemblance, many travellers repreſent this inſect as an ant, and ſpeak of it under this name. Its inſtinct diſpoſes it only to travel by night, thro' a ſort of galleries, which it forms, as it proceeds, of fat earth After reaching the end of its journey, it corrodes and deſtroys every thing, victuals, clothes, and furniture. We found an army of theſe in our chamber, for the firſt time, at Beitel Fakih. We immediately demoliſhed the galleries which they had formed; but they, without being diſcouraged or terrified at our preſence, renewed their work in the night, with ſingular obſtinacy, ſo that we had much ado to rid ourſelves of them. They live and work together like ants. The arda is alſo deſtructive to trees, the ſweetneſs of whoſe leaves and fruits gratifies its taſte. Theſe inſects fix upon trees of this character, and extend their galleries from the root to the top. The inhabitants of the country have no other means for preſerving their gardens from utter ruin, except to ſurround the trees with ſheep's dung, the ſmell of which the arda cannot endure.—There are in Arabia many ants, but moſt of them are harmleſs as ours. From among theſe, however, are to be excepted two ſpecies, one of which

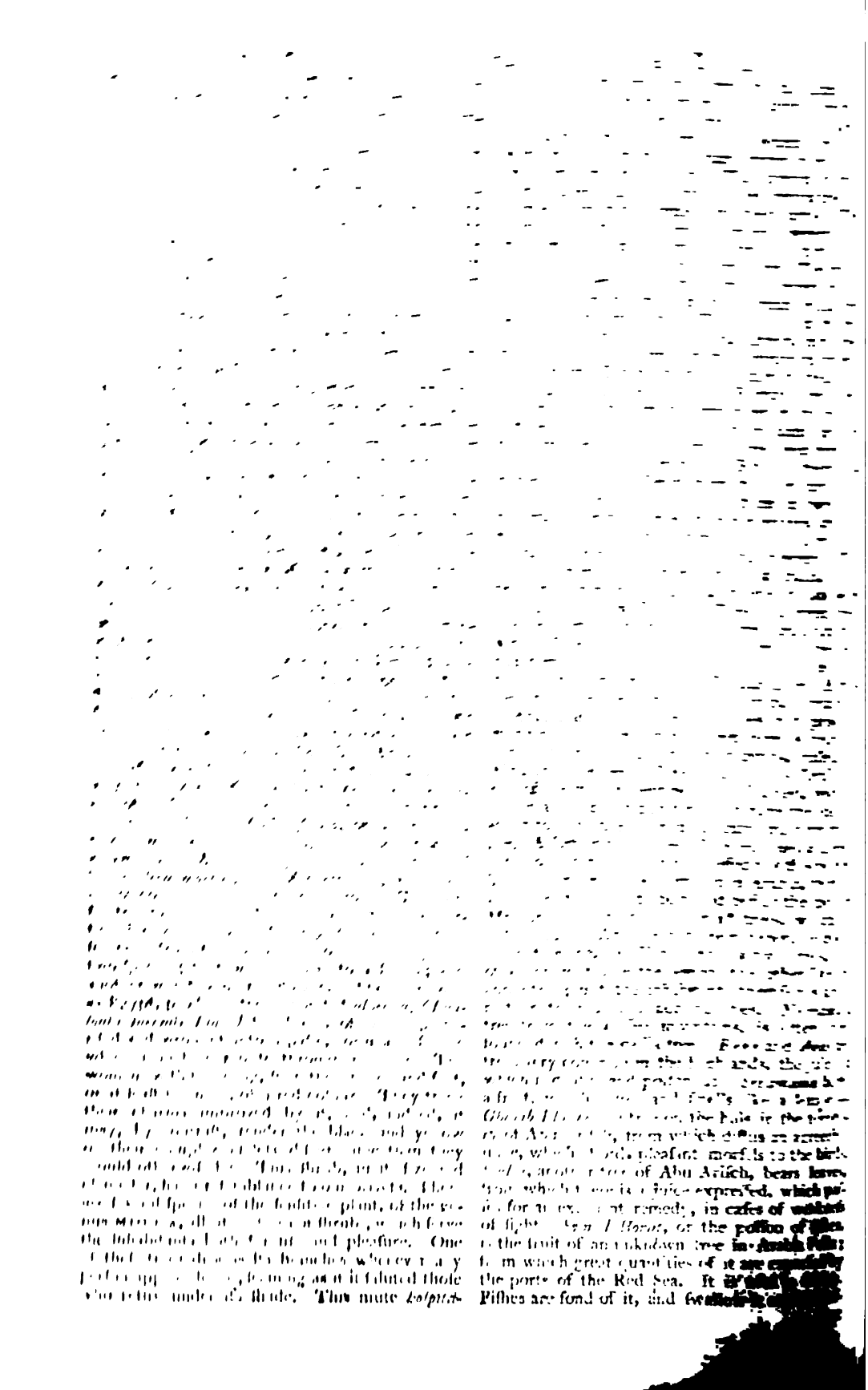
which becomes troubleſome by the voracity with which it attacks victuals, unleſs driven away by the odour of camphor; the other's bite is little leſs painful than that of the ſcorpion. A ſort of SCOLOPENDRA likewiſe torments the inhabitants of this country, and affects thoſe on whom it fixes with burning pains. This inſect fixes all its feet into the fleſh, ſo that it is impoſſible to rid one's ſelf of it otherwiſe than by ſucceſſively burning all the parts affected with a hot iron. The cuttle fiſh is dangerous to ſwimmers and divers, of whom it lays hold with its long claws. Theſe do not wound, but produce ſwelling, internal pains, and often an incipient paralyſis. Among the TENEBRIONES is one ſpecies which deſtroys reeds. Probably this ſmall inſect attacks likewiſe the ſtalks of corn in which is obſerved a farina, which ſerves to diffuſe the eggs of this inſect through houſes. This little animal is therefore one of the moſt troubleſome inſects in this country. The women of Arabia and Turkey make uſe of another tenebrio, which is found among the filth of gardens. As plumpneſs is thought a beauty in the eaſt, the women, in order to obtain this beauty, ſwallow, every morning and evening, three of thoſe inſects fried in butter. The Red Sea is full of marine inſects; *Priapi, Salpa, Fiſtulares, Meduſa*, &c. Mr Forſkal became more and more convinced, in the courſe of his obſervations, that the immenſe numbers of theſe animals contribute to produce the refulgence which is perceived at night in ſea water. This inſect ſeems to be an animated phoſphoric body." Mr Neibuhr concludes his account of Arabian entomology, by deſcribing "the aſtoniſhing maſs of works formed by marine inſects; namely, the immenſe banks of coral bordering, and almoſt filling up the Arabic gulph. Great part of the houſes in the Tehama are of coral rock. Mr Forſkal uſed to look upon every Arabic houſe as a cabinet of natural hiſtory, as rich in corals as any ſuch cabinet in Europe. The reader may therefore conceive what a variety of madrepores and millepores are to be met with in theſe ſeas. Some are ſo curious as to tempt us conſtantly to take ſpecimens of them; but their bulk renders it impoſſible to carry theſe away. Theſe coral rocks, riſing ſometimes ten fathoms above the ſurface of the ſea, are ſoft under the waters: And hence, being eaſily wrought, they are preferred to all other ſtones for the purpoſes of building."

(12.) ARABIA, SOIL, MINERALS, &c. OF. Arabia, in general, is neither rich nor fertile. Mr Neibuhr ſays, "The ſoil of ſeveral of the countries which we viſited are leſs favourable, than is commonly ſuppoſed, for the increaſe of vegetables and animals. The ſoil of Arabia is, through a great part of that country, dry and ſandy, produces no plants, and is therefore unfit for the nouriſhment of animals. In the high lands of Arabia, there are as great diverſities of ſoil as in moſt other cultivated countries. The moſt general character of the ſoil on theſe ſchiſtous hills is clay mixed with ſand. But the figure of the hills is unfavourable to their fertility. They are commonly ſo craggy and precipitous, as to afford neither room nor ſoil for vegetable productions, the good earth being continually waſhed away by the waters. Theſe circumſtances have likewiſe the effect of rendering the culture of ſuch places extremely difficult and expenſive. Terraces are neceſſary to be formed; of which indeed the conſtruction is ſometimes facilitated by the piles of baſaltes naturally caſt into regular pentagonal figures, which are broken, from time to time, from the rocks, and ſerve as materials to form the walls. Beſides theſe maſſes there are calcareous, vitrifiable, and ſand ſtones; ferruginous ſpars, mixed with brown or white ſelenite, almoſt tranſparent; a blueiſh gypſum, a grey ſchiſtus, and ſpheric marcaſſites, in beds of grit-ſtone; from which ſtones are hewn for building. Arabia affords, however, ſtones of greater value. The onyx is common in Yemen; and in a hill near the town of *Damar* is found the ſtone AYEK JEMANI, which is in the higheſt eſtimation among the Arabians. It is of a dark red, or rather a light brown colour, and ſeems to be a ſort of cornelian. The Arabians ſet it in rings of bracelets, and aſcribe to it the virtue of ſtopping the bleeding of wounds when inſtantly applied. Among the *ſtones of Mokha*, which are, properly ſpeaking, Indian cornelians, brought from Surat to Arabia and Europe, pieces are found which bear a perfect reſemblance to this Ayek Jemani. We ſaw two little hills, conſiſting almoſt entirely of foſſile ſalt; one near Loheya, and the other in the neighbourhood of Hodeida. Thoſe maſſes of ſalt are piled up in large tranſparent ſtrata, and incloſed in a cruſt of calcareous ſtone. The Arabians formerly dug up this ſalt, but the galleries of the mines have ſunk down, and it is now neglected. We were told, however, that foreign veſſels ſometimes came to load with this ſalt, from the hill near the iſle of *Kameran*, in the neighbourhood of Hodeida. Arabia does not appear to be rich in metals. The old Greek and Latin writers go even ſo far as to aſſert that it is abſolutely deſtitute of iron. This is not true; for grains of iron are to be ſeen among the ſands which are waſhed down by the rains. Magnets are commonly to be met with in the province of Kuſma; and at Saade are iron mines, which are wrought at preſent. However, the iron of Yemen is coarſe and brittle; diſadvantages which cannot be remedied. Beſides, the ſcarcity of wood makes this iron dearer than that which is brought from diſtant countries. For this reaſon, iron is a commodity which ſtrangers can always diſpoſe of to advantage in the ports of the Red Sea. In Oman are many very rich lead mines. As this metal is more eaſily fuſible, the inhabitants of this province export great plenty of it. This trade is carried on from the harbour of Maſkat. As the ancients honoured one part of Arabia with the title of *Happy*, it ſhould ſeem that they muſt have aſcribed to it all poſſible advantages. The Greeks and Latins accordingly make ample mention of the immenſe quantity of gold which this country produced. In remote times poſſibly, when the Arabians were the factors of the trade to India, much of this precious metal might paſs through Arabia into Europe; but that gold was probably the produce of the mines of India. At preſent, at leaſt, there is no gold mine in Arabia. The rivulets bring down no grains of this metal from the hills; nor does

does the ſand ſhew any marks of ſo rich an intermixture. All the gold now circulating in Arabia is from Abyſſinia or Europe, and is received in payment either for coffee, or for India goods, which are ſold at Jidda or Mokha. The Imam of Sana, when he wiſhed to ſtrike a little gold coin, was obliged to melt down foreign money for the purpoſe. The gold which paſſes from Europe into Arabia, conſiſts almoſt altogether of Venetian ſequins. On this account ſome Arabians aſked, if the Venetians were the only nation of Europe who had gold mines! Others fancied that the Venetians were in poſſeſſion of the philoſopher's ſtone!"

(13.) ARABIA, TREES, FRUITS, SHRUBS, &c. OF. "The ſandy plains of Arabia are almoſt deſtitute of trees; only a few plants are ſcattered here and there. Foreſts are to be ſeen only in the Highland provinces, where the hills retain enough of earth for vegetation; but even in the highlands are rare. The trees in thoſe foreſts are either abſolutely unknown, or at leaſt different from our European trees of the ſame genera or ſpecies. The principal of them are, the *Sceura*, *Tomex*, *Catha*, *Cynanchum*, *Mæru*, *Bæka*, *Haledi*, and ſeveral ſpecies of the fig-tree unknown among us. The Arabians cultivate ſeveral of our fruit trees. They have pomegranate, almond, apricot, pear and apple trees. Here is a ſpecies of pear tree, and a corneil tree peculiar to Arabia. The Arabians likewiſe eat the fruit of ſeveral of our ſhrubs, ſuch as the aſclepias and the rhamnus. Although the Mahometans drink no wine, the Arabians plant the vine, and have a great variety of grapes. They dry a ſmall ſort of grape, called kiſchmiſch, which has no ſtone, but only ſoft, and almoſt impalpable ſeeds; and of theſe grapes they ſell a quantity to their neighbours. They alſo make from mint a ſyrup, named *dub*, which they find a pretty lucrative article of commerce. Several ſorts of lemons and oranges are found in Arabia. If an inference may be drawn from the names which the Arabians have given them, one ſhould ſuppoſe that they have had an orange tree from Portugal, and two lemon trees from Italy. From common oranges cut through the middle while they are green, dried in the air, and ſteeped 40 days in oil, is prepared an eſſence famous among old women for reſtoring a freſh black colour to grey hairs. The Banians have tranſported various fruit trees from India, which are now naturalized in Arabia; ſuch are the Baniao tree (*Muſa Linn.*); the Mangouſtan, (*Mangifera, Linn.*); the *Papaya* (*Carica Papaya Linn.*); and the *Ciſſus Linn.* Arabia produces the date tree; but their other palms, and eſpecially the *Cocos*, ſeem to be from India. The Indian fig tree, FICUS VARTA, although now very common in Arabia, is perhaps not a native. The ſingular property which this tree poſſeſſes, of ſpreading itſelf, by means of filaments ſhooting from its branches, which, when they reach the ground, take root, and form new trunks, is well known. Mr Forſkal ſaw a dozen ſpecies of indigenous fig trees in Arabia, which are not mentioned by Linnæus. The fruit is far from delicate; ſeldom eatable. The bark of one ſpecies is uſed in tanning leather. Of another the leaves are ſo rough, that they are uſed for cleaning and poliſhing iron. The reſt are only ſo many uſeleſs trees of the foreſt. The tamarind in Arabia, as well as in India, is equally uſeful and agreeable. It has a pulp of a vinous taſte, of which a wholeſome refreſhing liquor is prepared. Its ſhade ſhelters houſes from the torrid heat of the ſun, and its fine figure greatly adorns the ſcenery of the country. The inhabitants are alſo fond of raiſing over their houſes the ſhade of the Indian fig tree. Arabia appears to be very rich in indigenous trees, the number of which is more than proportionate to its peculiar herbaceous plants. But great trees are not eaſily removed from one place to another; and thoſe of the foreſts, in the back parts of the country, are ſeldomer ſeen by travellers than the other vegetables. Hence, it is no wonder that we have been hitherto ſo ignorant concerning the trees of Arabia. More than half the new genera claſſed by Mr Forſkal comprehend trees only. He ſaw likewiſe other 18 trees, the genera of which he had no opportunity of aſcertaining; not to mention a great many others, of which he could learn only the Arabic name. CATHA is one of thoſe new genera peculiar to Arabia. This tree, which is improveable by culture, is commonly planted among the coffee ſhrubs on the hills where theſe grow. The Arabians are accuſtomed conſtantly to chew the buds of this tree, which they call KAAD; they are as much addicted to this practice, as the Indians to that of chewing betel. To their kaad they aſcribe the virtues of aſſiſting digeſtion, and of fortifying the conſtitution againſt infectious diſtempers. Yet its inſipid taſte gives no indication of extraordinary virtues. The only effects we felt from the uſe of thoſe buds were the interruption of our ſleep. ELCAYA and KEURA, two trees famous for their perfume, form two new genera. The former is common on the hills of Yemen; and the women ſteep its fruits in water, which they uſe for waſhing and perfuming the head. The ſecond bears ſome reſemblance to the palm tree, and produces flowers of a rich and delicious ſmell. Theſe flowers are ſold at a high price, as the *keura* is rather a ſcarce plant. But one little knot, if preſerved in a cool place, will long continue to diffuſe its odours through a whole apartment. Children eat the fruit, which is inſipid enough, of a large tree called *oreeba*, and a tall ſhrub named *marua*. Both theſe too, are new ſpecies diſcovered by Mr Forſkal. Such is alſo the *chadara*, a large tree, and the *antura*, a tree of a ſmaller ſize; neither of which has any thing remarkable to diſtinguiſh it, except its wood and its novelty. *Culkamia*, a large tree, alſo unknown to botaniſts, has nothing but its uſe to recommend it. *Cadaba* and *mæſa* are ſhrubs which have nothing particular about them, and might be paſſed over in ſilence, had not Mr Forſkal taken notice of them. Several ſhrubs which are indigenous in Arabia are of ſome uſe to the inhabitants. The fruit of a new genus, named *ſodada*, is eaten; from the berry of another new ſhrub, *cebatha*, is extracted a very ſtrong ſpecies of brandy, the acid taſte of which is improved by a mixture of ſugar. A ſort of that falſe phaſeolus, *dolichos*, which I have mentioned in ſpeaking of the plants, (See § 10.) grows up to a buſhy ſhrub, ſo

as



ter which, they float in a ſtate of ſeeming intoxication on the ſurface of the water. This ſeems to be a ſort of *nux vomica*: which is alſo obtained from the weſtern coaſts of India. The Arabians have little wood fit for building; their trees are moſtly of a light, porous texture. The *ſceura*, a new genus, deſcribed by Mr Forſkal, a tree that grows on the ſea ſhore, is ſo ſoft, that no uſe can be made of it."

ARABIAN ALPHABET. The Arabian alphabet conſiſts of 28 letters; which are ſomewhat ſimilar to the ancient Kufic, in which character, the firſt copies of the Koran were written. The preſent characters were formed by Ebn Moklah, a learned Arabian, who lived about 300 years after Mahomet. The moſt ancient characters peculiar to the Arabs, wherein the letters were not diſtinctly ſeparate, went by the appellation of *Al Moſnad*, from the mutual dependency of its letters or parts upon one another. This was neither publicly taught, nor ſuffered to be uſed, without permiſſion firſt obtained. Could we depend upon what Al Firauzabadius relates from Ebn Haſhem, this character muſt have been of a very high antiquity; ſince an inſcription in it, according to the laſt author, was found in Yemen, as old as the time of Joſeph. Be that as it will, Moramer Ebn Morra of Anbar, a city of Irak, who lived not many years before Mahomet, was the inventor of the preſent Arabic character, which Baſhar the Kendian, who married the ſiſter of Abu Sofian, is ſaid to have learned from the houſe of Anbar, and to have introduced at Mecca, but a little time before the inſtitution of Mahometaniſm. Moramer's alphabet the oriental authors agree to have been very different from the ancient one of the Hamyarites, ſince they diſtinguiſh the Hamyaritic and Arabic pens. In Mahomet's time, the Morameric alphabet had made ſo ſmall a progreſs, that no one in Yemen could either write or read it; nay, Mahomet himſelf was incapable of doing either; for which reaſon, he was called the *illiterate prophet*. The letters of this alphabet were very rude; being either the ſame with, or very much like, the Kufic; which character is ſtill found in inſcriptions and the titles of ancient books; nay, for many years, it was the only one uſed by the Arabs, the Koran itſelf being at firſt written therein. In order to perpetuate the memory of Moramer's invention, ſome authors call the Arabic letters *al Moramer*, i. e. *the progeny of Moramer*. The moſt remarkable ſpecimens of the Kufic character (ſo denominated from Kufa, a city of Irak, where ſome of the firſt copies of the Koran were written) are the following: Part of that book in it on vellum, brought from Egypt by Mr Greaves; ſome other fragments of the ſame book in it publiſhed by Sir John Chardin; certain paſſages of a MS. in the Bodleian library; the legends on ſeveral Saracenic coins, dug up not many years ago, on the coaſt of the Baltic, not far from Dantzick; and, according to Profeſſor Hunt, thoſe noble remains of it are, or were lately to be ſeen in Mr Joſeph Ames's valuable collection of antique curioſities. As to the true origin of the ancient and modern Arabic alphabets, we muſt own ourſelves pretty much in the dark. See ALPHABETICAL CHARACTERS, § 1, 2, and 3.

ARABIAN HERESY. See ARABICI.

ARABIAN LANGUAGE. See ARABIANS, § 11.

ARABIAN LOGIC, that of Ariſtotle, as explained by Avicenna and Averrhoes. See ARABIANS, § 12.

ARABIAN MARBLE, ARABICUM MARMOR, a name given by the ancient Greeks to a ſpecies of marble, brought from Egypt and Arabia, and remarkable for its beautiful whiteneſs.

ARABIAN ORATORY, according to Renaudot, conſiſted in a luxuriancy of quaint, high-flown words, epithets, and deſcriptions.

ARABIAN PHILOSOPHY, PHYSIC, &c. See ARABIANS, § 12, 17, and 18.

(1.) ARABIANS, AGRICULTURE OF THE. In Arabia, although the government is auſpicious to agricultural induſtry, yet Mr Niebuhr ſays, "the inſtruments of huſbandry are coarſe and ill made. The plough uſed is of a very ſimple ſtructure, is drawn by oxen, and is dragged over the ground in every direction, till the ſoil ſeems to be ſufficiently broken and looſened for the reception of the ſeed. In the neighbourhood of Bagdad, aſſes are yoked in the plough with oxen; and near Moſul, two mules. In cultivating their gardens, and ſuch ſpots in their fields as are not acceſſible to the plough, the Arabians uſe a ſort of hoe, and in digging very deep, a large crow, managed by two men, one of whom preſſes it in the ground, and the other draws it towards himſelf with cords. In many parts of Yemen, whole fields are cultivated like a garden. Agriculture is in ſuch places, however, a very laborious taſk, for much care is requiſite in watering the grounds. In the highland part of this province, the fields are often formed into terraces, and watered in the rainy ſeaſon by canals from the hills. The inhabitants of the plain are obliged to encompaſs their fields with dykes, that the water may remain for ſome time upon the ſurface of the ground. The inhabitants of the upper parts collect the water neceſſary for their fields in dams formed at the foot of the hills. Beſides private dams, there are likewiſe very large public reſervoirs, formed by carrying a wall between two hills. In the plain of Damar, the fields are watered out of very deep draw wells, from which the water is drawn by ſtrength of arm. It is ſurpriſing that the Arabians adopt not the hydraulic machines which are uſed by their neighbours in Egypt, and in India. I ſaw them ſow in the highlands of Yemen. A peaſant bearing a ſackful of lentiles, dropped them here and there in the furrows, juſt as we ſow peas in our gardens; and, as he went on, covered the ſeed by puſhing in the mould with his feet on both ſides. In other places, the ſower followed the ploughman, and caſt the ſeed into the furrow, which the other returning, covered up with his plough. Both theſe modes of ſowing are exceeding troubleſome; for the ſower muſt make as many turns backwards and forwards, as there are furrows; but there is a ſaving in the quantity of the ſeed, no part of which can be withered by the winds, or pecked up by birds. In Arabia in general, only a ſmall quantity of ſeed is uſed; the peaſant, truſting to the regula-

rity of the ſeaſons, does not expoſe his grain to periſh in the ground, by ſowing it at an improper time. This is another proof of the fallacious nature of inferences concerning the fertility of the ground, deduced from the proportion between the ſeed and the increaſe. In ſome diſtricts in Yemen, maize and durra are planted with the hand. I ſaw likewiſe, in the highlands, between Moſhak and Sehan, ſome fields, in which thoſe grains grew in rows, like our cabbages in Europe. They were the fineſt fields I ever ſaw in my life. The ſtalks were all of the ſame height, and every plant was thriving and luxuriant. In adjoining fields, were ſome unpromiſing enough crops of the ſame grain, which is a proof that the Arabian peaſants are not all alike induſtrious. The corn fields in the places about Beit el Fakih were alſo full of cockle weeds, and irregularly ſown. Near Mount Mharras, I ſaw a peaſant draw furrows with a ſmall plough, between ſtraight rows of corn, of which the ſtalks were from nine to ten inches high. His oxen were ſo yoked, that they paſſed between the rows without treading down any of the plants. The intention of this piece of labour was to deſtroy weeds, to cover the roots of the plants with earth, and to open the ſoil for the reception of moiſture. The weeds which ſtill remained, were pulled up with the hand, and given to cattle. Thus the huſbandry of Tull and Du Hamel, although novel in Europe, is very old in Arabia."

(2.) ARABIANS, ASTRONOMY OF THE. "The modes of the diviſion of time in uſe among the Arabians ſhow how little progreſs this nation have made in aſtronomy. They know indeed a little of its elements; but this, it ſhould ſeem, rather from tradition, than from any obſervations of their own. Their day conſiſts of 24 hours, and laſts from ſun ſetting to ſun ſetting. Their hours are therefore of uncertain duration, and vary with the length of the natural day, or the time during which the ſun is above the horizon. As they are ſtrangers to the uſe of watches, none of them has any preciſe idea of the duration of their hours, but, like the peaſants of Europe, they diſtinguiſh the different parts of the day by vague, uncertain denominations, which only approach near the truth. Their year conſiſts of 12 lunar months. They begin the month with the new moon; and, when the ſky is ſo clouded that they cannot ſee her riſe, then they make no difficulty of beginning the month a day or two later. Thus all their months go the round of the ſeaſons; and this diviſion of the year marks out no period for the labours of huſbandry, or any of the other employments of civil life. To obviate this inconvenience, the learned reckon by other months correſponding to the courſe of the ſolar year, and conſiſting of the ſame number of days as ours. In Arabia, as in other Mahometan countries, two great feſtivals are annually celebrated; that of offerings, called Arafa or Corban, and that of Beiram, immediately after Ramadan. The reckoning by lunar months occaſions theſe feſtivals alſo to circulate through the whole year. When the faſt of Ramadan falls in ſummer, it is extremely diſtreſſing; for the people, however employed in labour, dare taſte nothing, even in the longeſt days of the year, till the ſun is down. At Conſtantinople, the ſultan's aſtronomer compoſes every year a portable almanac, of which there are at leaſt ſeveral copies made. But, in Egypt and Arabia, this mode of acquainting the people with the return of the feſtivals, and the progreſs of the ſeaſons, has not been thought of, and ſo ignorant are they on this head, that the ſame feſtival is ſometimes two days earlier, and ſometimes as much later, and often on different days at different places. A cloud hiding the new moon from the city, while ſhe is ſeen by another, will be ſufficient to produce theſe irregularities. It is not for want of a paſſion for aſtronomy that the Arabians have made ſo little progreſs in this ſcience. But they want books and inſtruments. They have the work of Abdarachman es Sofi upon the conſtellations, and the tables of Ulug-Beigh, by which ſome aſtronomers in the great towns are enabled to calculate eclipſes. Their inſtruments are a celeſtial globe of copper, bedecked with golden ſtars, which they well know how to uſe; an aſtrolabe of braſs, and a quadrant of wood, to take altitudes, and to determine the hour for prayer. It is known to the aſtrologers, and to all men of ſenſe in Arabia, that eclipſes are owing to the interception of the light of one heavenly body by the interpoſition of another. But the people ſtill maintain the ſuperſtitious opinion, that a huge fiſh purſues the planet which is eclipſed. To chaſe away the fiſh, women and children get upon the roofs of the houſes, and make a noiſe during the eclipſe by beating upon brazen kettles and baſons. The riſe of this cuſtom is referred to an Arabian aſtronomer, who perſuaded the people of this fable, that they might make a noiſe great enough to reach the ears of the caliph of Perſia, who had refuſed to credit that aſtronomer's prediction of the eclipſe. The Arabians ſeem to ſtudy aſtronomy ſolely with a view to their ſucceſs in the cultivation of aſtrology, a ſcience highly eſteemed and very lucrative in the Eaſt. The Koran expreſsly forbids all Moſlems to pry into futurity by any form of divination; and the moſt famous commentators for this reaſon repreſent the ſtudy of aſtrology as criminal. But, notwithſtanding the deciſion of these doctors, the Mahometans are all much attached to this ſcience."

(3.) ARABIANS, CHARACTER OF THE. The following character of the Arabians is drawn by Mr Niebuhr. "Climate, government, and education, are, undoubtedly, the great agents which form and modify the characters of nations. To the firſt of theſe the Arabs owe their vivacity, and their diſpoſition to indolence; the ſecond increaſes their lazineſs, and gives them a ſpirit of duplicity; the third is the cauſe of that formal gravity which influences the faculties of their mind, as well as their carriage and exterior aſpect. No two things can differ more than the education of the Arabs from that of the Europeans. The former ſtrive as much to haſten the age of maturity, as the latter to retard it. The Arabs are never children; but many Europeans continue children *all their life*. In Arabia, boys remain in the haram, among the women, till the age of 5 or 6, and during this time follow the childiſh amuſe-

ments ſuitable to their years; but as ſoon as they are removed from that ſcene of frivolity, they are accuſtomed to think and ſpeak with gravity, and to paſs whole days together in their father's company, at leaſt if he is not in a condition to retain a preceptor, who may form them. As muſic and dancing are eſteemed indecent among the Arabs, women are alſo excluded from all aſſemblies, and the uſe of ſtrong drink is forbidden. The Arabian youth are ſtrangers to the pretended pleaſures which are ſo eagerly purſued by the youth of Europe. The young Arabs, in conſequence of being always under the eyes of perſons advanced to maturity, become penſive and ſerious even in infancy. Yet, under this air of gravity and recollection, the nation have in reality a great degree of vivacity in their hearts, which varies through the different provinces. The inhabitants of Yemen, living in a mild climate, and an agreeable air, have more animation in their character than thoſe of Hedsjas and Arabia Petræa, whoſe imagination receives a more gloomy caſt from the continual proſpect of barren deſarts and bare rocks. I have ſeen young Arabs in Yemen dance and leap, with arms in their hands, to the ſound of ſmall drums; yet, even the inhabitants of the deſart ſhew greater vivacity than the Turks. As for the melancholy Egyptians, I never ſaw them diſcover any mark of genuine joy, even at their feſtivals, however ſplendid. The vivacity in the Arabians makes them fond of company, and of large aſſemblies, notwithſtanding their ſeeming ſeriouſneſs. They frequent public coffee-houſes, and markets, which are ſo numerous through Yemen, that every village, of any conſiderable magnitude, has a weekly market. When the villages lie at too great a diſtance, the country people meet in the open fields, ſome to buy or ſell, and others to converſe, or amuſe themſelves as ſpectators of the buſy ſcene. Artiſans travel through the whole week from town to town, and work at their trade in the different markets. From this fondneſs of theirs for ſociety, it may be inferred, that the nation are more civilized than they are commonly ſuppoſed to be. Several travellers accuſe them of being cheats, thieves, and hypocrites. An arbitrary government, which impoveriſhes its ſubjects by extortion, can have no favourable influence indeed upon the probity of the nation; yet, I can ſay, from my own experience, that the accuſations laid againſt them have been exaggerated above the facts. The Arabs themſelves allow that their countrymen are not all honeſt men. I have heard them praiſe the fidelity with which the Europeans fulfil their promiſes, and expreſs high indignation againſt the knavery of their own nation as a diſgrace to the Muſſulman name."

(4.) ARABIANS, CUSTOM OF THE. Mr Niebuhr has a whole chapter upon the peculiar cuſtoms of the Arabians, amongſt which he ranks circumciſion, a cuſtom far from being *peculiar* to them;—excepting in ſo far as they extend it to female infants. Upon this ſubject, too, he indulges in ſome falſe reaſoning, which we will not quote, as, to a perſon who has read the Scriptures, it requires no refutation. His reflections upon the cleanlineſs of the Arabs appear to be more juſt. "In hot countries, (ſays he) cleanlineſs is indiſpenſibly neceſſary to health. The common people, who reaſon little, might forget or neglect a care ſo neceſſary to their welfare. For this reaſon have the founders of ſeveral ſects enjoined purifications and ablutions as a religious duty. The Arabians are obliged to be extremely cleanly by the laws equally of their climate and their religion; and they obſerve theſe precepts with the moſt ſcrupulous exactneſs. They not only waſh, bath, and pair their nails very often, but cut away all hairs from the body; and pluck them from thoſe parts upon which the razor cannot be employed, that not the leaſt impurity may remain upon them. Thoſe are held in contempt who exerciſe uncleanly trades, ſuch as the ſervants at the public baths, barbers, cooks, tanners, &c. This contempt, however, falls upon the employment, without operating to the excluſion of the perſon exerciſing it from ſociety. The corruption of dead bodies has the moſt deſtructive effects upon the health in hot countries; more ſo than in more temperate climates. It was therefore neceſſary to ſecure the inhabitants, from its noxious influence, by increaſing, through religious motives, their natural averſion for dead carcaſes. Mahomet, and ſome other founders of ſects, have for this reaſon affixed ideas of ſpiritual impurity to the act of touching a dead body. Some Muſſulmans require great purification to cleanſe a man thus defiled, and ſeparate him for ſome time from ſociety. The Arabians are leſs rigid; when a perſon of this nation has had the misfortune to touch a carcaſe, he waſhes himſelf carefully, and when no mark of external impurity remains, he then returns to the ordinary intercourſe of life. A frugal nation, who regard even ſobriety as a virtue, muſt naturally affix ideas of ſhame to every thing that indicates any degree of intemperance. The Arabians are greatly ſhocked when *that accident* happens to a man, which is the natural conſequence of the fulneſs of the inteſtines after too copious a meal, and the indigeſtion of *windy* articles of diet. The Chevalier D'Arvieux has been blamed as guilty of exaggeration in what he ſays concerning the delicacy of the Arabs upon this ſcore; but I have found all that he ſays of the manners and uſages of this nation to be ſtrictly true. I am therefore inclined to believe equally what he relates concerning things which I could not obſerve or verify myſelf. It ſhould ſeem that the Arabs are not all equally ſhocked at ſuch an involuntary accident. Yet, a Bedouin, guilty of ſuch a piece of indecency, would be deſpiſed by his countrymen. An Arab of the tribe of *Belludsje*, for a reaſon of this ſort, was obliged to leave his country, and never durſt return. The ignorance of the Arabians ſubjects them to all the illuſions of ſuperſtition. They wear almoſt all amulets upon their arms; on their fingers they have ordinary rings. Their religion is ſaid to oblige them to take off their rings, which are of glod, or ſet with precious ſtones, whenever they ſay their prayers, which if this precaution were neglected, would be of no efficacy. They ſeem to think, that, in order to be heard, they muſt appear before the Deity in the utmoſt humiliation and abaſement.

(5.) ARABIANS, DISEASES OF THE. Tempe-

fance and regularity are the ſureſt preſervatives of health. The Arabians are accordingly free from many diſeaſes common in Europe. They are, however, ſubject to ſome diſeaſes peculiar to their climate. "The leproſy (ſays Mr Niebuhr) ſeems to have been always an endemic diſeaſe in Arabia, for there is one ſpecies of leproſy which authors diſtinguiſh by the character of Arabian. Three different varieties of this diſeaſe are known here at preſent; of which two, named *Bohak* and *Barras*, are rather diſguſting than dangerous; but the 3d called *Juddam*, is very malignant, and apparently infectious. This latter exhibits the ſame ſymptoms which the Engliſh phyſician *Hillary* aſcribes to what he calls *the leproſy of the joints*. The Turks, from a miſconception of the doctrine of predeſtination, uſe no precautions againſt the plague; but the Arabians, although true Muſſulmans, are more careful in reſpect to the leproſy.—The laſt prince of Abu Schæhur uſed to ſend to the iſle of Bahhrein all who were attacked with the leproſy, or with venereal complaints. At Baſra, lepers are ſhut up in a houſe by themſelves; and there is a quarter in Bagdad ſurrounded with walls, and full of barracks, to which the lepers are carried by force, if they retire not thither voluntarily; but government does not ſeem to provide with any care for the maintenance of thoſe lepers. They come out every Friday to the market place to aſk alms. It is ſaid that theſe wretched creatures are much inclined to ſooth their miſery in the enjoyments of love. Not may years ſince a leper employed a cruel ſtratagem in order to obtain a woman with whom he was in love.—He wore a fine ſhirt for a few days, and then cauſed it to be privately ſold, for a trifling price, to the object of his paſſion. When he knew that the leproſy had made its appearance upon her, he informed againſt her, and procured her to be ſhut up with himſelf in the barracks. In Arabia, the leproſy is thought to be occaſioned chiefly by the unwholeſome food, eſpecially putrid fiſh, uſed by the people. Mr Forſkal has left a deſcription of the different varieties of the leproſy, which muſt be valuable to phyſicians. A diſeaſe very common in Yemen is the attack of the Guinea-worm, or the Vena Medinenſis, as it is called by the phyſicians of Europe. This diſeaſe is ſuppoſed to be occaſioned by the uſe of the putrid waters, which people are obliged to drink in ſeveral parts of Yemen; and for this reaſon the Arabians always paſs water, with the nature of which they are unacquainted, through a linen cloth, before drinking it. When one unfortunately ſwallows any of the eggs of this inſect, no immediate conſequence follows; but after a conſiderable time the worm begins to ſhew itſelf through the ſkin. Our phyſician, Mr Cramer, was, within a few days of his death, attacked by five of theſe worms at once, although this was more than five months after we had left Arabia. In the iſle of Karek, I ſaw a French officer, named Le Page, who, after a long and difficult journey, performed on foot, and in an Indian dreſs, between Pondicherry and Suart, through the heat of India, was buſy extracting a worm out of his body. He ſuppoſed that he had got it by drinking bad water in the country of the Marattas. This diſorder is not dangerous, if the perſon affected can extract the worm without breaking it. With this view, it is rolled on a ſmall bit of wood, as it comes out of the ſkin. It is ſlender as a thread, and two or three feet long. It gives no pain as it makes its way out of the body, unleſs what may be occaſioned by the care which muſt be taken of it for ſome weeks. If unluckily it is broken, it then returns into the body, and the moſt diſagreeable conſequences enſue, palſy, a gangrene, and ſometimes death."

(6.) ARABIANS, DOMESTIC LIVES OF THE. "Arabia affords no elegant or ſplendid apartments for the admiration of the traveller. The houſes are built of ſtone, and have always terrace roofs. Thoſe occupied by the lower people are ſmall huts, having a round roof, and covered with a certain herb. The huts of the Arabs on the banks of the Euphrates are formed of branches of the date tree, and have a round roof covered with ruſh mats. The tents of the Bedouins are like thoſe of the Kurdes and Turcomans. They have the aſpect of a tattered hut. They are formed of coarſe ſtuffs prepared by the women. The palaces of Arabians of rank diſplay no exterior magnificence. Ornaments are not to be expected in the apartments of men who are ſtrangers to all luxury, except what conſiſts in the number and the value of their horſes, ſervants, and arms.—The poor ſpread their floors with ſtraw mats, and the rich with fine carpets. No perſon ever enters a room, without having firſt put off his ſhoes. The men of every family always occupy the fore part of the houſe, and the women the back part. If the apartments of the men are plain, thoſe of the women are, on the contrary, moſt ſtudiouſly ſet off with decorations. Of this I ſaw a ſpecimen in a haram, which was nearly finiſhed for a man of rank. One room in it was wholly covered over with mirrors; the roof, the walls, the doors, the pillars, preſented all ſo many looking glaſſes. The floor was ſet with ſofas, and ſpread with carpets. Arabians, in circumſtances which admit not of their having ſeparate apartments for the females of the family, are careful, whenever they carry a ſtranger into the houſe, to enter before him, and cry *turik*, retire. Upon this notice, the women inſtantly diſappear. It is reckoned highly impolite to ſalute a woman, or even to look her ſtedfaſtly in the face. The retired life of the women diſpoſes them to behave reſpectfully to the other ſex. I met a Bedouin lady, who, purely out of reſpect, left the road, and turned her back upon me; and I ſeveral times have ſeen women kiſs the hands of a man of diſtinction, or kneel to kiſs his feet. The great often have in their halls baſons with *jets d'eau*, to cool the air. As the people of the eaſt wiſh to keep their floors very clean, they ſpit very little, although they ſmoke a great deal. Yet to ſpit is not reckoned a piece of impoliteneſs. Some perſons of rank uſe a ſpitting box, and others ſpit on the bottom of the wall, behind the cuſhion on which they ſit. The uſe of chairs is unknown in the eaſt. The Arabians practiſe ſeveral different modes of ſitting. When they wiſh to be very much at their eaſe, they croſs their legs under the body. This mode of ſitting is the moſt commodious for people who wear long clothes, and wide breeches, without any confining ligatures.

It

It seems to afford better rest, after fatigue, than our posture of sitting upon chairs. In presence of superiors, an Arab sits with his two knees touching each other, and with the weight of the body resting upon the heels. This is the posture in which they usually place themselves at table. In many parts of Arabia, there are long, low chairs, made of straw mats; but they sit cross legged on them, as well as on the carpets. The life which the Arabians lead in their houses, is so vacant and unvaried, that they cannot help feeling it irksome. Their natural vivacity prompts them to seek amusement out of doors. They frequent coffee-houses, and markets, and are fond of assembling in public meetings as often as possible. Yet they have not the same means of diversion as other nations. They are often obliged to take up with sedentary and domestic amusements, which to Europeans appear very insipid. It is, no doubt, to divert the tædium of a sedentary life, that the people of the east make so much use of tobacco. The Arabians use the long Persians pipe. A custom peculiar to Arabia, is, that persons of opulence carry always about them a box filled with odoriferous wood. They put a bit of this wood into any person's pipe, to whom they wish to express particular respect; and it communicates to the tobacco a fragrant smell. Instead of taking opium, they constantly chew *kaad*. This is the buds of a certain tree, which are brought in small boxes from the hills of Yemen. Persons who have good teeth chew these buds just as they come from the tree for the use of old men it is brayed in a mortar. It seems to be from fashion merely that these buds are chewed; for they have a disagreeable taste, and are unfavourable to sleep. The lower people are fond of raising their spirits to a state of intoxication. As they have no strong drink, they smoke *boschisch*, which is the dried leaves of a sort of hemp. This exalts their courage, and throws them into a state in which delightful visions dance before the imagination. As the people of the east squat themselves upon the ground when they sit, their manner of eating is conformable to this way of sitting. They spread a large cloth in the middle of the room, put upon this cloth a small table only one foot high, and upon the table a large round plate of tinned copper. Upon this are set different copper dishes, neatly tinned within and without. Instead of table napkins, Arabians of rank use a long linen cloth, which those at table put under their knees. Where this linen cloth is wanting, every one uses a small handkerchief of his own. They use no knives nor forks. The Turks have sometimes wooden or horned spoons; but the Arabians use their fingers with great dexterity, and eat all dishes with the hand. Were we to judge by the standard of our own manners, the people of the east behave very indecently at an European table. I could not help being much struck by the behaviour of the first Turk I saw eat, who was the comptroller of the customs of the Dardanelles, in company with whom I happened to soup at the French Consul's table. He tore his meat in pieces with his fingers, and wiped them with his napkin. My surprise ceased when I became more familiar with the manners of these people. They know not the use of table napkins, and suppose them to be handkerchiefs, with which they are to wipe themselves. They are much at a loss when a piece of meat is to be cut; for they think it indecent to make use of the left hand in cutting it, as with it they perform their ablutions. They manage better when the meats are cut into small bits, before being set down on the table. We, Europeans, were at first shocked to see so many hands in the dish together. But, as the Mahometans are obliged, by their religion, to pay the utmost attention to personal cleanliness, there is in reality little difference, in point of delicacy, between their mode of eating and ours. The Schiechs in the desart eat of nothing but *pilau*, or boiled rice. It is served up in a very large wooden plate. The company sit down and eat, one after another, till the whole contents of the plate be exhausted, or they are satisfied. In the houses of persons of distinction in the towns, several of these plates are set, one upon another, in a pyramidical form. When the masters rise, the servants sit down at the same table, and eat up what remains. They eat with amazing quickness. At Merdin we emptied more than 14 plates within less then 20 minutes. The Arabs, repeat always a short prayer before sitting down to a meal, "In the name of the most merciful God." When any one has done eating, he rises, without waiting for the rest, and says, "God be praised." They drink little while they eat, but, as they rise from the table, after washing, they drink some cold water, and a cup of coffee. The Arabians are not less fond than the Turks of coffee, which they call *Kahwe*. They prepare it in the manner which we have adopted from them. The only difference, between their mode of preparing it and ours, is, that they, instead of grinding their coffee beans, pound them in a mortar. The pounding seems better to express the oily parts of the bean, which give the coffee its peculiar relish. They always drink their coffee without milk or sugar. Although the Mussulmans are forbidden the use of all intoxicating liquors, yet many of them are passionately fond of them, and drink them privately, and at night, in their own houses. On the frontiers of Arabia, where there are Christians, both wine and spirituous liquors are to be found; but in Arabia, none of these are to be obtained, except from the Jews of Sana, who have great plenty and that of excellent quality. They supply their countrymen; but, having no casks, they are obliged to carry their wine and brandy in copper vessels, which renders the use of them dangerous to the health. The English, too, sometimes bring arrack from India to Mokha. The Arabians are, in general, a sober, frugal nation, which is probably the cause of their leanness, and seemingly stinted growth. Their usual articles of food are rice, pulse, milk, butter, and keimak, or whipped cream. They are not without animal food; but they seldom eat of it; for it is thought very unwholesome in those hot countries. Mutton is the most common species of food used here; and on it the Arabians of the desart chiefly live. The common people in Arabia have little other food, but bad bread made of durra, a sort of coarse millet, by kneading it with camel's milk, oil, butter, or grease. The modes of baking are different in different places of Arabia.

In

In the ſhip in which we ſailed from Jidda to Loheya, there was a ſailor, whoſe taſk every afternoon was to prepare durra for next day's bread. He bruiſed the grain between two ſtones, one of which was convex, the other concave. Of the meal thus prepared, he formed dough, and then divided into ſmall cakes. In the meantime, the oven was heated; but it was ſimply an earthen pot glazed; and a fire of charcoal was kindled up within it; the cakes were laid againſt the ſides of the pot, without removing the coals, and in a few moments the bread was taken up half roaſted, and was eaten hot. The Arabians of the deſart uſed a heated plate of iron, or a gridiron, in preparing their cakes. When they have no gridiron, they roll their dough into balls, and put it either among live coals, or into a fire of camel's dung, where they cover it till it is penetrated by the heat. They then remove the aſhes, and eat the bread, while it is ſcarcely dry, and ſtill hot. In the towns, the Arabians have ovens like ours; their bread is of barley meal, and of the form and thickneſs of our pancakes; but they never give it enough of the fire."

(7.) ARABIANS, EDUCATION OF THE. "The monarchs of the eaſt do not take the ſame care, for the encouragement of ſcience as the ſovereigns of Europe. In Arabia, there are neither numerous academies, nor men of profound learning. Yet the Arabian youth are not entirely neglected. In the cities, many of the loweſt of the people are taught to read and write; the ſame qualifications are alſo common among the Schiechs of the deſart, and in Egypt. Perſons of diſtinction retain preceptors in their families to inſtruct their children and young ſlaves; for they bring up ſuch of their young ſlaves as appear to poſſeſs abilities, like children of the family. In almoſt every moſque is a ſchool, denominated *Meddraſſe*, having a foundation for the ſupport of teachers, and the entertainment and inſtruction of poor ſcholars. In great towns are likewiſe other ſchools, to which people of middle rank ſend their children to receive religious inſtruction, and to learn reading, writing, and arithmetic. No girls attend theſe ſchools; they are privately taught by women. There are in ſome great towns in Arabia, colleges in which aſtronomy, aſtrology, philoſophy, and medicine are taught; in theſe the Arabians, although poſſeſſed of natural abilities, have for want of good books and maſters, made but little progreſs. In the dominions of the Imam, there have long been two famous academies; one at Zebid for *Sunnites*, and the other at Damar for the *Zeidites*. The interpretation of the Koran, and the ſtudy of the ancient hiſtory of the Mahometans, are the principal employments of men of letters among the Arabians. Theſe ſtudies take up much time; for the ſtudent muſt not only acquire the ancient Arabic, but alſo make himſelf familiar with all the commentators on the Koran, the number of whom is very conſiderable. All men of letters undergo a public examination, before they can be promoted to any employment, civil or eccleſiaſtical. Yet thoſe examinations are ſurely conducted with partiality; for many perſons, indifferently qualified, riſe to conſiderable offices, while men of merit are often obliged to act as tranſcribers or ſchoolmaſters.

(8.) ARABIANS, FASHIONS AND DRESS OF THE. "There is a great variety in the national dreſs of the Arabians, and various faſhions prevail among them. Nothing can be more inconvenient or expenſive than the head-dreſs worn by Arabians of faſhion. They wear *fifteen caps*, one over another, ſome of which are indeed of linen, but the reſt of thick cloth or cotton. That which covers all the reſt is uſually richly embroidered with gold, and has always ſome ſentence of the Koran embroidered upon it. Over all theſe caps they wrap a large piece of muſlin, called a *Saſeh*, ornamented at the ends, which flow looſe upon the ſhoulders, with ſilk or golden fringes. As it muſt be very diſagreeable, in a hot country, to have the head always loaded in this manner, the Arabians, when in their own houſes, or with intimate friends, lay aſide this uſeleſs weight, all to one or two of the caps. But, before perſons whom they are obliged to treat with ceremony or reſpect, they dare not appear without their turbans. Thoſe who deſire to paſs for men of learning, diſcover their pretenſions by the bulk of their turbans. Arabians of rank wear one piece of dreſs, which is not in uſe among the other inhabitants of the Eaſt. This is a piece of fine linen upon the ſhoulder, which ſeems to have been originally intended to ſhelter the wearer from the ſun and rain, but is now merely ornamental. The common claſs of Arabs wear only two caps, with the *Saſeh* carleſsly bound on the head. Some have drawers and a ſhirt; but the greater number have only a piece of linen about their loins, a large girdle with the *Jambea*, and a piece of cloth upon the ſhoulders; in other reſpects they are naked, having neither ſhoes nor ſtockings. In the highlands, where the climate is colder, the people wear ſheep ſkins. The ſcanty clothes, which they wear through the day, are alſo all their covering by night; the cloth ſwaddled about the waiſt ſerves for a mattraſs; and the linen garment worn about the loins is a ſheet to cover the Arab while he ſleeps. The highlanders, to ſecure themſelves from being infeſted by inſects, ſleep in ſacks. Perſons in a middle rank of life wear, inſtead of ſhoes, ſandals, being merely ſingle ſoles, or ſometimes thin pieces of wood, bound upon the foot with a ſtrap of dreſſed leather. People of better fortune uſe ſlippers, like thoſe worn through the reſt of the Eaſt; and this is alſo the dreſs for the feet worn by the women. The ordinary dreſs of the Arabs is ſimple enough; but they have alſo a ſort of great coat, without ſleeves, called *Abba*, which is ſimpler ſtill. In the province of Lachſa, the Abba is commonly uſed by both ſexes. In ſeveral places in Arabia, the men wear no drawers; but theſe with a large ſhirt are all the dreſs uſed by the lower women. In the Tehama, women of this claſs wrap a linen cloth about their loins in the manner of drawers. The women of Hedjas veil their faces, like thoſe of Egypt, with a narrow piece of linen, which leaves both the eyes uncovered. In Yemen, they wear a larger veil, which covers the face ſo entirely, that the eyes can hardly be diſcerned. At Sana and Mokha,

ha, they cover the face with a gauze veil, which is often embroidered with gold. They all wear rings on their fingers, arms, noſe, and ears. They ſtain their nails red, and their hands and feet of a browniſh yellow colour, with the juice of the plant *Elbenne*. The circle of the eyes and even the eye-laſhes, they paint black, with a preparation of lead ore called *Kochbel*. The men ſometimes imitate this mode of painting the eyes with *Kochbel*; but perſons of ſenſe laugh at ſo effeminate a practice. The women of Yemen alſo make black punctures in their face to improve their beauty. Their natural complexion is a deep yellow: but among the hills, are perſons of fair complexions and fine faces, even among the peaſantry. In the towns, women, who think themſelves handſome, lift, up their veils to ſhew their beauty, whenever they think they can do it unobſerved. Faſhion ſhews its influence, in the modes in which the hair and beard are worn in Arabia. In the Imam of Sana's dominions, all men, of whatever ſtation, ſhave their heads. In other parts of Yemen, all men, even the Schiechs, preſerve their hair, wrap it in a handkerchief, and knot in up behind; caps and turbans are not in uſe there. Some of the highlanders keep their hair long and looſe, and bind the head with ſmall cords. Every body, without exception, wears the beard of its natural length; but the Arabs keep their muſtachios very ſhort. In the highlands of Yemen, where few ſtrangers are ever ſeen, it is diſgraceful to appear without a beard. Our ſervant wore only his muſtachios; and thoſe good highlanders fancied that we had ſhaven him by way of puniſhment for ſome fault. The Arabians have all black beards. Some old men, when their beards are whitened by time, dye them red; but this practice is generally diſapproved. The Jews, through all the Eaſt, preſerve their beards from their youth. They wear the beard not in the ſame form as the Muſſulmans and Chriſtians, ſhaving none of it about the temples and the ears. To diſtinguiſh themſelves ſtill more from the reſt of mankind, they retain two tufts of hair hanging over their ears. The Jews of Arabia reſemble thoſe of Poland; only they have a more decent and leſs beggarly aſpect. They dare not wear the turban, but are obliged to content themſelves with a ſmall bonnet. Neither are they ſuffered to dreſs in any colour but blue; all their clothes are of blue cloth. There are many *Banians* ſettled in Arabia. Their dreſs conſiſts of a turban of a particular form, a piece of linen upon the ſhoulders, another piece of linen fixed by a ſtring about their loins, and ſlippers. Some alſo wear over theſe pieces of dreſs a long white robe, which plaits upon the haunches, and fits cloſe upon the body and the arms. Theſe Indians uſed to dreſs entirely in white; but they received, ſome years ſince, an order from Sana, enjoining them to wear red clothes. To obtain a diſpenſation from this change of dreſs, they paid a conſiderable ſum to the Imam, and the order was revoked. They were ſoon after enjoined, by another edict, to wear a red, inſtead of a white turban: But, not chooſing to buy off this injunction, they obeyed, and now wear a red turban, with the reſt of their dreſs white.

(9.) ARABIANS, HOSPITALITY OF THE. Mr Niebuhr, after deſcribing the politeneſs of the Arabians, contraſting it with the rudeneſs of the Turks, and mentioning as a proof that the Arabian governments wiſh to obtain the friendſhip of the Europeans, their exacting eaſier duties from them, than from other nations, adds,—"The chief part of Arabian politeneſs is hoſpitality; a virtue which is hereditary to the nation, and which they ſtill exerciſe in its primitive ſimplicity. An ambaſſador ſent to any prince or Schiech has his expences defrayed, and receives preſents, according to the cuſtom of the Eaſt. A traveller of any diſtinction, who ſhould go to ſee any great Schiech in the deſart, would receive the ſame treatment. I have ſpoken occaſionally of the *Kans* and *Manjaks*, or houſes of hoſpitable entertainment, in which I was received on my travels. What appears to diſtinguiſh the Arabians from the other inhabitants of the Eaſt, is, that they exerciſe hoſpitality to all, without reſpect of rank or religion. The Arabians invite all who come in while they are at table, to eat with them, whether great or ſmall, Mahometans or Chriſtians. In the caravans, I have often had the pleaſure of ſeeing a poor muleteer preſs paſſengers to ſhare his meals, and, with an air of ſatisfaction, diſtribute his little ſtore of bread and dates to all who would accept any part of it from him. I have, on the other hand, been ſhocked at the behaviour even of rich Turks, who retired to a corner to eat by themſelves, that they might avoid aſking any one to partake of their fare. When a Bedouin Schiech eats bread with ſtrangers, they may truſt his fidelity, and depend upon his protection. A traveller will always do well therefore to take an early opportunity of ſecuring the friendſhip of his guide by a meal. When two Arabians ſalute each other, he who ſpeaks firſt lays his right hand on his heart, and ſays, *Salam Alekum*, or, "peace be with you;" the other replies, *Alekum ſſalam*, or, "with you be peace." Old perſons commonly add their bleſſing, or rather, "the mercy and bleſſing of God" The Mahometans of Egypt and Syria never ſalute the Chriſtians in theſe words; but content themſelves with ſaying to them, *Sebaebel chair*, "good day," or, *Sabbeb Jalamat*, "friend, how art thou?" In Yemen, this diſtinction is not obſerved."

(10.) ARABIANS, INDEPENDENCE OF THE.—There is the ſtrongeſt reaſon to believe, that the inhabitants of the peninſula properly called ARABIA, have remained independent of every conqueror that the world hath yet produced The perpetual independence of the Arabs, indeed, has been the theme of praiſe among ſtrangers and natives. The kingdom of Yemen it is true, has been ſucceſſively ſubdued by the Abyſſinians, the Perſians, the ſultans of Egypt, and the Turks; the holy cities of Mecca and Medina have repeatedly bowed under a Scythian tyranny; and the Roman province of Arabia embraced the peculiar wilderneſs in which Iſmael and his ſons pitched their tents in the face of their brethren. Yet theſe exertions are temporary or local: the body of the nation has eſcaped the yoke of the moſt powerful monarchies: the arms of Seſoſtris and Cyrus, of Pompey and Trajan, could never atchieve the conqueſt of Arabia; the preſent

reign of the Turks may exercise a shadow of jurisdiction, but his pride is reduced to solicit the friendship of a people whom it is dangerous to provoke, and fruitless to attack. The obvious causes of their freedom are inscribed on the character and country of the Arabs. Many ages before Mahomet, their intrepid valour had been severely felt by their neighbours, in offensive and defensive war. The patient and active virtues of a soldier are insensibly nursed in the habits and discipline of a pastoral life. The care of the sheep and camels is abandoned to the women of the tribe; but the martial youth, under the banner of the emir, is ever on horseback, and in the field, to practise the exercise of the bow, the javelin, and the scymetar. The long memory of their independence is the firmest pledge of its perpetuity; and succeeding generations are animated to prove their descent and to maintain their inheritance. Their domestic feuds are suspended on the approach of a common enemy; and in their last hostilities against the Turks, the caravan of Mecca was attacked and pillaged by 80,000 of the confederates. When they advance to battle, the hope of victory is in the front; and in the rear the assurance of a retreat. Their horses and camels, who in eight or ten days, can perform a march of 400 or 500 miles, disappear before the conqueror; the secret waters of the desert elude his search; and his victorious troops are consumed with thirst, hunger, and fatigue, in the pursuit of an invisible foe, who scorns his efforts, and safely reposes in the heart of the burning solitude. The arms and desarts of the Bedouins are not only the safeguards of their own freedom, but the barriers also of the Happy Arabia, whose inhabitants, remote from war, are enervated by the luxury of the soil and climate. The legions of Augustus melted away in disease and lassitude; and it is only by a naval power that the reduction of Yemen has been successfully attempted. When Mahomet erected his holy standard, that kingdom was a province of the Persian empire; yet seven princes of the Homerites still reigned in the mountains; and the vicegerent of Chosroes was tempted to forget his distant country, and his unfortunate master. The historians of the age of Justinian represent the state of the independent Arabs, who were divided by interest or affection in the long quarrel of the East; the tribe of Gassan was allowed to encamp on the Syrian territory: the princes of Hira were permitted to form a city about forty miles to the southward of the ruins of Babylon. Their service in the field was steady and vigorous; but their friendship was venal, their faith inconstant, their enmity capricious: it was an easier task to excite them to disarm these roving barbarians; and, in the familiar intercourse of war, they learned to see, and to despise, the splendid weakness, both of Rome and of Persia. From Mecca to the Euphrates, the Arabian tribes were confounded by the Greeks and Latins, under the general appellation of Saracens; a name which every Christian mouth has been taught to pronounce with terrror and abhorrence. The slaves of domestic tyranny may vainly exult in their national independence; but the Arab is personally free; and he enjoys, in some degree, the benefits, of society without forfeiting the prerogatives of nature. In every tribe, superstition, or gratitude, or fortune, has exalted a particular family above the heads of their equals. The dignities of Schiech and emir invariably descend in this chosen race; but the order of succession is loose and precarious; and the most worthy or aged of the noble kinsmen are preferred to the simple, though important, office of composing disputes by their advice, and guiding valour by their example. The momentary junction of several tribes produces an army: their more lasting union constitutes a nation; and the supreme chief, the emir of emirs, whose banner is displayed at their head, may deserve, in the eyes of strangers, the honours of the kingly name. If the Arabian princes abuse their power, they are quickly punished by the desertion of their subjects, who had been accustomed to a mild and parental jurisdiction. Their spirit is free, their steps are unconfined, the desart is open, and the tribes and families are held together by a mutual and voluntary compact. The softer natives of Yemen supported the pomp and majesty of a monarch; but if he could not leave his palace without endangering his life, the active powers of government must have been devolved on his nobles and magistrates. The cities of Mecca and Medina present, in the heart of Asia, the form, or rather the substance of a commonwealth. The grandfather of Mahomet, and his lineal ancestors, appear in foreign and domestic transactions, as the princes of their country; but they reigned, like Pericles at Athens, or the Medici at Florence, by the opinion of their wisdom and integrity; their influence was divided with their patrimony; and the sceptre was transferred from the uncles of the prophet to a younger branch of the tribe of Koreish. On solemn occasions, they convened the assembly of the people; and, since mankind must be either compelled or persuaded to obey, the use and reputation of oratory among the ancient Arabs, is the clearest evidence of public freedom. But their simple freedom was of a very different cast from the nice and artificial machinery of the Greek and Roman republics, in which each member possessed an undivided share of the civil and political rights of the community. In the more simple state of the Arabs, the nation is free, because each of her sons disdains a base submission to the will of a master. His breast is fortified with the austere virtues of courage, patience, and sobriety; the love of independence prompts him to exercise the habits of self command; and the fear of dishonour guards him from the meaner apprehensions of pain, of danger, and of death. The gravity and firmness of the mind is conspicuous in his outward demeanor: his speech is flow, weighty, and concise; he is seldom provoked to laughter; his only gesture is that of stroaking his beard, the venerable symbol of manhood; and the sense of his own importance teaches him to accost his equals without levity, and his superiors without awe. The liberty of the Saracens survived their conquests: the first khalifs indulged the bold and familiar language of their subjects: they ascended the pulpit to persuade and edify the congregation; nor was it before the seat of empire was removed to the Ti-

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gris, that the Abbaſſides adopted the proud and pompous ceremonials of the Perſian and Byzantine courts.

(11.) ARABIANS, LANGUAGE OF THE. The Arabians having inhabited the country they at preſent poſſeſs, almoſt from the deluge, without intermixing with other nations, or being ſubjugated by any foreign power, their language muſt have been formed ſoon after, if not at, the confuſion of Babel. The two principal dialects of it were, that ſpoken by the Hamyarites and other genuine Arabs, and that of the Koreiſh, in which Mahomet wrote the Koran. The firſt is ſtyled by the Oriental writers the *Arabic* of *Hamyar*, and the other *the pure* or *defecated*. As Yarab, grandfather of Hamyar, is ſuppoſed by the Oriental writers to have been the firſt whoſe tongue deviated from the Syriac to the Arabic, the Hamyaritic dialect, according to them, muſt have approached nearer to the purity of the Syriac; and conſequently have been more remote from the true genius of the Arabic than that of any other tribe. The dialect of the Koreiſh, termed by the Koran *the perſpicuous and clear Arabic*, is referred to Iſhmael as its author; who, ſay the above mentioned writers, firſt ſpoke it; and, as Dr Pococke believes, after he had contracted an alliance with the family of Jorham by marriage, formed it of their language and the original Hebrew. As, therefore, the Hamyaritic dialect partook principally of the Syriac, ſo that of the Koreiſh was ſuppoſed to conſiſt chiefly of the Hebrew. But, according to Jallalo'ddin, the politeneſs and elegance of the dialect of the Koreiſh ought rather to be attributed to their having, from the remoteſt antiquity, the cuſtody of the Caaba, and dwelling in Mecca the centre of Arabia. The Arabs are full of commendations of their language, which is very harmonious, expreſſive, and, as they ſay, ſo immenſely copious, that no man *uninſpired* can be a perfect maſter of it in its utmoſt extent! In copiouſneſs it muſt be owned it exceeds even the Greek. Sometimes a bare enumeration of the Arabic names of one particular thing, and an explication of them, will make a conſiderable volume! Notwithſtanding this, the Arabs believe the greateſt part of their language to be loſt; which will not ſeem improbable, when we conſider how late the art of writing became generally practiſed among them. For though it was known to Job their countryman, to the Edomites, as well as the other Arabian nations bordering upon Egypt and Phœnicia, and to the Hamyarites many centuries before Mahomet, as appears from ſome ancient monuments ſaid to be remaining in the Arabic character; yet the other Arabs, and thoſe of Mecca in particular, except ſuch of them as were either Jews or Chriſtians, were to the time of Moramer perfectly ignorant of it. It was the ancient Arabic language preceding the reign of Juſtinian, which ſo nearly reſembled the Ethiopic; for ſince that time, and eſpecially ſince the age of Mahomet, all the Arabic dialects have been not a little corrupted. This is now the learned or rather the *dead* language of the Mahometans, who ſtudy it as the European Chriſtians do the Hebrew, Greek, and Latin. This corruption of the Arabian dialects Mr Niebuhr thus accounts for. "Although the Arabian conquerors introduced and eſtabliſhed their language in the countries which they conquered; yet their ſubjects did not always leave off the uſe of their mother tongue. In Syria and Paleſtine, indeed, no language is to be heard but the Arabic; and yet the Syriac is not abſolutely a dead language, but is ſtill ſpoken in ſeveral villages in the Pachalic of Damaſcus In many places, in the neighbourhood of Merdin and Moſul, the Chriſtians ſtill ſpeak the Chaldean language; and the inhabitants of the villages who do not frequent towns, never hear any other than their mother tongue. The Chriſtians born in the cities of Merdin and Moſul, although they ſpeak Arabic, write in the Chaldean characters, juſt as the Maronites write their Arabic in Syriac letters, and the Greeks the Turkiſh in Greek letters."

(12.) ARABIANS, LEARNING OF THE. The Arabian learning may be divided into two periods, viz. *Ante-Mahometan* and *Mahometan*. The Arab learning, in this firſt period, conſiſted, according to Abulpharagius, in the knowledge of their language, the propriety of diſcourſe, the compoſition of verſe, and the ſcience of the ſtars: but their chief attention ſeems to have been directed to oratory and poetry. The ſecond period is more diſtinguiſhed, at leaſt from the time of Al-Maimon, the ſeventh caliph of the family of the Abbaſſides, who flouriſhed about the year 820, and has the honour of being the founder of the modern Arabian learning. He ſent for all the beſt books out of Chaldea, Greece, Egypt, and Perſia, relating to phyſic, aſtronomy, coſmography, muſic, chronology, &c. and penſioned a number of learned men, ſkilled in the ſeveral languages and ſciences, to tranſlate them into Arabic. By this means, divers of the Greek authors, loſt in their own country and language, have been preſerved in Arabic. From that time Arabia became the chief ſeat of learning; and we find mention by Abulpharagius, Pococke, D'Herbelot, and Hottinger, of learned men, and books without number. The revival of learning in Europe in the 10th century, by Gerbert, known after his elevation to the pontificate by the title of Silveſter II. may be juſtly aſcribed to the writings of the Arabian philoſophers, and to the ſchools which they founded in ſeveral parts of Spain and Italy. And in the 12th century, many of the learned productions of the Arabians were tranſlated into Latin, which facilitated the general progreſs of ſcience. See § 17, 18, 19.

(13.) ARABIANS, MARRIAGES OF THE. "The Europeans, (ſays Mr Niebuhr,) are miſtaken in thinking the ſtate of marriage ſo different among the Muſſulmans from what it is with Chriſtian nations. The women of Arabia ſeem to be as free and happy as thoſe of Europe can poſſibly be. Polygamy is permitted, indeed, among Mahometans, and the delicacy of our ladies is ſhocked at this idea; but the Arabians rarely avail themſelves of the privilege of marrying four lawful wives, and entertaining at the ſame time any number of female ſlaves. None but rich and voluptuaries marry ſo many wives, and their conduct is blamed by all ſober men. Men of ſenſe, indeed, think this privilege rather troubleſome than convenient. A huſband, is by law, obliged to treat his wives ſuitably

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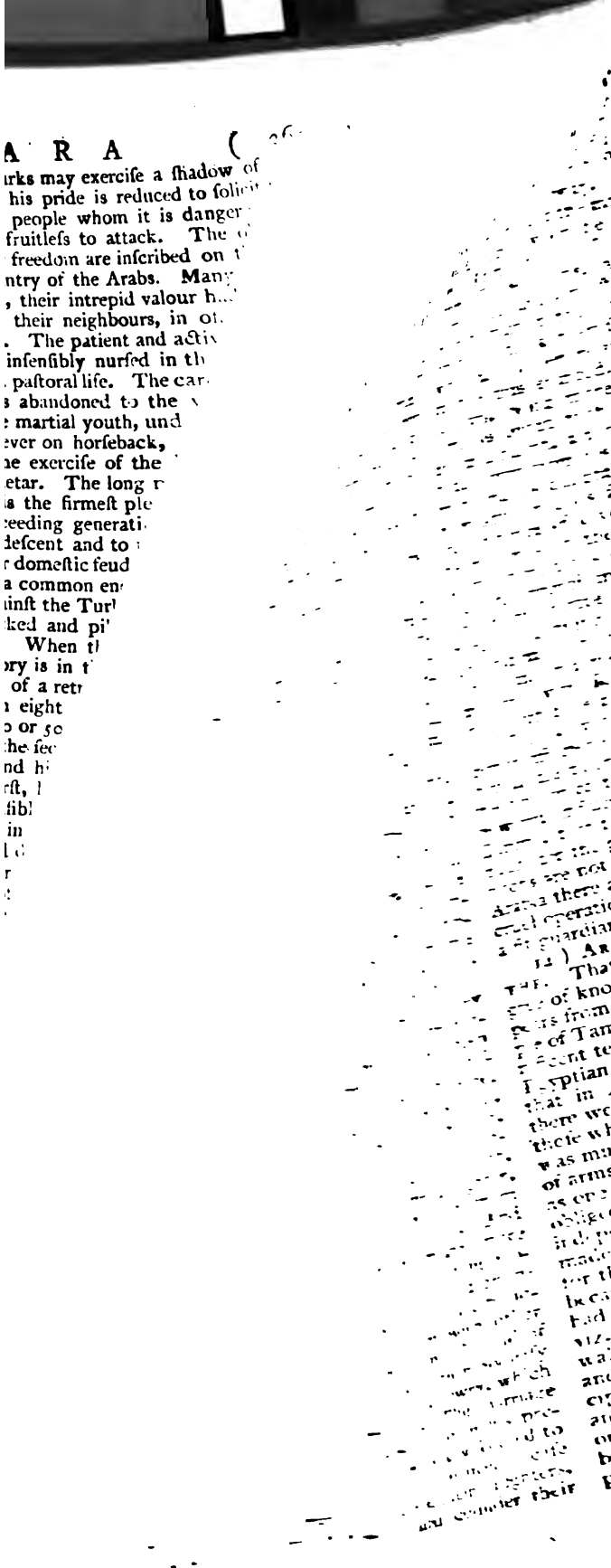

ARABIANS. MECHANIC ARTS AMO

That the Arabs very early had a good
of knowledge in several mechanical arts, a
ts from Strabo, who informs us, that the pa
of Tamna and the adjacent provinces had m
cent temples, and elegant houses, built in
Egyptian taste. The same authority informs
that in Arabia Felix, besides the husbandr
there were many artificers; and, amongst th
those which made palm wine, which, he inform
was much used by the Arabs. As for the
of arms and horsemanship, they looked upon
as one of their principal accomplishments,
obliged to practise and encourage it by reason
independency of their tribes, wherefrom it
made wars almost continual amongst them, w
for the most part ended in field battles. Hence
became an usual saying amongst them, that G
had bestowed four peculiar things on the Ara
viz. "turbans instead of diadems, tents instead
walls and houses, swords instead of written laws." The p
and poems instead of written laws." The p
cipal arms used by the ancient Arabs were b
and arrows, darts or javelins, and broad swo
or scymitars. The bows and arrows were
by Ishmael himself, according to Scripture. It
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births. Moſt of thoſe, even in the
n of life, know not who were their
rs, and would often be as much at a
ow their fathers, if it were not regulated
om, that the ſon ſhall join his father's
with his own. All thoſe petty princes who
em in Arabia are, undoubtedly, very proud of their birth, and with ſome reaſon, ſince their families have, from time immemorial, enjoyed independence and ſovereign power. The nobility, who are free, or dependent only on the chiefs of their tribes, are equally ſo. They enjoy privileges which the traditional hiſtory of the nation repreſents as having always belonged to certain families. The Schiechs are excuſable, therefore, although they value themſelves upon advantages which are peculiarly theirs. What adds to the high conceit the Bedouin Schiechs have of their nobility, is its being incommunicable, and not to be conferred by any ſovereign prince, or even by the caliphs. As it is founded on the cuſtoms of a paſtoral people, who know no diſtinction of rank, but that of the heads of families, no ſovereign can augment the number of theſe chiefs. Nobles can be *created* only in countries where the nobility form a diſtinct claſs, enjoying certain civil privileges, which may be equally conferred on others. The Bedouin nobility may be compared to the chiefs of the clans among the Scotch highlanders, who are in a very ſimilar condition with reſpect to their honours and authority. The deſcendents of Mahomet hold, with ſome reaſon, the firſt rank among the great families in Arabia. Mahomet was ſprung from one of the nobleſt families in the country, and roſe to the rank of a potent prince. His firſt profeſſion of a dealer in camels, proves him to have been a Schiech of the genuine and pure nobility of his nation. It may be inferred, however, from the ſingular veneration in which his family are held, that religious opinions have contributed to gain them the preeminence which they hold, above even the moſt ancient ſovereign houſes. A ſect naturally reſpect the poſterity of their founder, as a race bearing an indelible character of ſanctity. Theſe deſcendents of Mahomet have received different titles. In Arabia they are called Sherriffes, or *Sejids*; in the Mahometan countries ſituate northward, Sherriffes or Emirs; and in the Arabian colonies in the Eaſt, ſimply Seijds. The prince of *Haviſa*, on the frontiers of Perſia, takes the title of *Maula*, which has, I believe, been alſo aſſumed by the Emperor of Morocco. In ſome countries, this family are diſtinguiſhed by a green turban. Nay, on the coaſts of Arabia, ſhips hoiſt a green flag, when fitted out by a Sejid. Yet the green turban is not invariably a diſtinctive mark of a deſcendent of Mahomet. Beggars ſometimes wear turbans of this colour; and one of our ſervants did the ſame, and was blamed by nobody. The Sherriffes of Hedsjas are eſteemed the nobleſt of Mahomet's deſcendents, becauſe they have made fewer intermarriages with ſtrangers than the reſt of the Prophet's poſterity. In that province, they are treated with almoſt incredible reſpect. A Sherriffe may venture into the midſt of a fray without the ſmalleſt fear of being intentionally hurt or killed. He needs not to ſhut his doors againſt thieves. In the Ottoman provinces, the family of the prophet is leſs regarded. In my time, a Sejid, who had been guilty of divers crimes, and although warned and reproved by an indulgent governor, had not corrected his bad habits was condemned to ſuffer capital puniſhment. Having heard a diſtinction frequently made between a Sherriffe and a Sejid, I made inquiry into its nature. I learned that Sherriffes are conſtantly devoted to a military life, and are deſcended from *Haſſan*; but that the Sejids are the poſterity of *Hoſſein*, and follow the purſuits of trade and ſcience, although they have ſometimes riſen to ſovereign power in ſome parts of Arabia. There are, in all Mahometan countries, an aſtoniſhing number of Sherriffes. I ſaw whole villages peopled with this family ſolely. To thoſe who know not in what manner this title is tranſmitted, the numbers of thoſe who enjoy this high rank muſt undoubtedly appear ſurpriſing; but polygamy naturally multiplies families, till many of their branches ſink into the moſt wretched miſery. In my account of *Jebid*, I have mentioned my acquaintance with a Sherriffe in that city who was in extreme poverty. A peculiar cuſtom tends to the farther increaſe of the race of Sherriffes. The ſon of a woman of the family of Mahomet is eſteemed a Sherriffe, and tranſmits the honour to all his poſterity. I travelled through Natolia with a Turk, who was called ſimply *Achmet*, and wore the common turban, while his ſon was honoured with a green turban, and with the title of Sherriffe, becauſe his mother was a *Sherriffa*. Other ſimilar inſtances came within my knowledge in the provinces of Turkey; and, from various circumſtances, I was led to infer, that many perſons enjoy this title who are not at all connected with the prophet's family. The genuine Sherriffes, to ſtrengthen their party againſt the Caliphs, have acknowledged kindred with various powerful families who were entire ſtrangers to them." Mr Niebhur alſo tells us that the tribe of KORAISCH and 12 other families claim theſe hereditary diſtinctions.

(16) ARABIANS, OCCULT SCIENCES OF THE. Of theſe ſciences, Mr Niebuhr juſtly obſerves, "a deſcription would be too humiliating, did it not afford us conſolation, by ſhewing from what endleſs abſurdities we are ſaved by the ſtudy of ſound philoſophy. Thoſe pretended occult ſciences are in high eſtimation among the Arabians. None dare practiſe them, unleſs previouſly authoriſed by a maſter in the art, or, as the Arabians ſay,

without having for ſome time ſpread the carpet for prayer before the feet of a famous maſter. A certain proof of their veneration for theſe ſciences, is, that one of the firſt men in Mecca, and of the higheſt nobility in Arabia, Schiech *Mohammed el Djanadsjeni*, is now the moſt celebrated maſter of the ſcience of Ism Allah. This ſcience of Ism Allah, or of the name of God, is the moſt ſublime of all; for God is the lock, as Mahomet is the key; and conſequently none but Muſſulmans can acquire it. It enables its profeſſor to diſcover what is paſſing in the moſt diſtant countries, to make himſelf familiar with genii, and to oblige them to obey his pleaſure: to diſpoſe of the winds and ſeaſons as he chooſes; and to cure the bites of ſerpents, and many other diſeaſes. Perſons who have advanced far in the ſtudy of this ſcience, have attained, as there are inſtances to prove, to a facility of performing their prayers at noon, in the *Kaba* at Mecca, without going out of their own houſes in Bagdad or Aden for the reſt of the day. A merchant of Mecca, who had ſtudied this ſcience in that city, under the famous *Djsjanadsjeni*, aſſured me that he had himſelf, when in danger of periſhing at ſea, fixed to the maſt a billet written by the rules of art, which inſtantly calmed the ſtorm. The art of diſcovering hidden treaſure belongs alſo to this ſcience, in which the *Magrebins*, or Arabians of Barbary are known to excel. The 2d of theſe ſciences, called Simia, is not of ſo exhalted a nature, but has ſomething human in it. It only teaches juggling tricks. Although the moſt ſenſible of the Mahometan clergy diſapprove of this ſcience, ſome orders of derviſes apply to it, and practiſe it, as they ſay, to prove the truth of their religion, and the ſanctity of the founder of their order. Theſe pretended miracles are no where oftener performed than at Baſra, where I have ſeen a company of derviſes, of the order of *Bedr-eddin*, walk all day about in the ſtreets leaping, dancing, beating the drum, and making geſticulations with ſharp pointed irons, which they ſeemed to ſtrike into their eyes. In the ſame city, I was preſent at a feſtival which the derviſes of this order celebrate every year in honour of the birth of Mahomet. This ſcene was in the open air, and in the court of the moſque, which was illuminated with only three lamps. Several mullahs and derviſes began with ſinging ſome paſſages out of the Koran. They continued to ſing with the accompaniment of ſome drums; and, during the muſic, the other derviſes aroſe, took the ſharp pointed irons, and did as if they were piercing their bodies, and even driving the irons with mallets into their fleſh. Next appeared the principal actor, who, aſſuming an air of inſpiration, directed the muſic to proceed, and to be raiſed to higher animation, in order to aſſiſt his enthuſiaſm, or rather to ſtun the ears of the ſpectators. In this extacy, he threw up his turban in the air, looſened his hair, and pierced his body with five lances: then mounting upon a low building, upon which a pole, ſixteen feet long, and ſhod with a ſharp iron point, had been ſet up, he impaled himſelf upon the pole, and was carried in this condition through the ſquare. It was an affecting ſight, to ſee a lean man, with a long beard, and diſhevelled hair, wounded all over with ſpikes, and then carried about ſpitted upon a pole! I ſaid, as I went away, to a mullah of my acquaintance, that the derviſe performed his tricks by means of a broad belt which he carried in his long wide drawers. The mullah replied, that he had ſuſpected ſome ſuch art, but avoided mentioning his ſuſpicions, leaſt he might draw upon himſelf the enmity of the order of Bedr-Eddin; for that one of his brethern had experienced great perſecution from thoſe derviſes, in conſequence of preſuming to hint his doubts of the reality of their miracles. Underſtanding that the impaled derviſe went alſo about, exhibiting in private houſes for money, I offered him two ducats, if he would come and ſhew me what he could do. He accepted my offer, came and began with a long harangue on the dignity of his order, and its founder, who had tranſmitted to his diſciples the gift of working miracles. After this he prayed, and puſhed the ſpikes with violence into his head and body. I examined the places into which the points had ſeemed to enter, and found the ſkin ſlightly torn, but without effuſion of blood. I however thought that he had ſuffered enough for two ducats, and diſmiſſed him. The ſcience of *Kurra* teaches to compoſe billets, which ſecure the wearer from the power of enchantment, and from accidents of all ſorts. Theſe billets are incloſed in ſmall purſes of ſkin, and worn on the head, the arm, or the breaſt. They are likewiſe bound upon the necks of horſes and aſſes, to give them an appetite for their food or to tame them when unmanageable. In the citadel of *Diarbekir*, a billet of this ſort put an end to a troubleſome croaking of frogs! The efficacy of theſe billets depends on the day, the hour, and the particular condition of the meſſenger who is ſent to aſk for them; and they are not the worſe for being written by a Jew or a Chriſtian. Being thought an aſtrologer, I was often aſked for ſuch. Theſe billets are at leaſt no worſe than thoſe for making hens lay, which were publickly ſold by a Jeſuit, in the middle of the eighteenth century, and among enlightened nations. The ſcience of Ramle is properly the art of fortune telling. Jews as well as Muſſulmans, deal in it. When a man falls ſick, his friends, in order to learn whether he will recover, ſend to conſult a mullah, who returns an anſwer, after examining his book, and receives for his pains a cock or a ſheep. A ſcience truly occult, and which every Arabian of worth muſt hold in abhorrence, is what they call Sihhr, or pure ſorcery. The end of this ſcience is rather to do miſchief to another perſon, than to do good to the perſon who practiſes it. It is ſometimes employed, to ſeduce a wife from the arms of her huſband into thoſe of a ſtranger. All that is requiſite for this is to fix a certain billet on her door. I found in Arabia more votaries than I expected of an occult ſcience of a different ſort the purſuit of the *philoſopher's ſtone*. The Arabians are ſo paſſionately addicted to this ſcience, that they often ruin their fortunes by it, as the alchemiſts of Europe have been accuſtomed to do. They ſuppoſe the ſecret of making gold to be known in Europe, eſpecially among the Venetians. They have books in their own language which treat of that ſcience, and inſpire them with

wild

wild hopes. It ſhould ſeem, that the idea of the philoſopher's ſtone is originally oriental, and has been brought weſtward, like many other fooliſh fables."

(17.) ARABIANS, PHILOSOPHY OF THE. The philoſophy of the Arabians, before Mahomet, was Sabian and included the ſyſtem and ceremonies of that ſect of idolaters. This it was that Mahomet ſet himſelf to decry; and he is even ſaid by ſome to have carried his oppoſition ſo far, as to prohibit, if not puniſh, all ſtudy of philoſophy. But his followers, by degrees, got over this reſtraint; the love of learning increaſed; till, under the memorable caliphate of Al-Maimon, Ariſtotle's philoſophy was introduced among them; and from them propagated, with their conqueſts, through Egypt, Africa, Spain, and other parts. As they choſe Ariſtotle for their maſter, they chiefly applied themſelves to that part of philoſophy called *logic*, and thus became proficients in the knowledge of words rather than of things.—Whence they have been ſometimes denominated *Maſters of the wiſdom of words*; ſometimes the *Talking Sect*. Their philoſophy was involved in quaint arbitrary terms and notions, and their demonſtrations drawn from thence as from certain principles, &c.

(18.) ARABIANS, PHYSIC OF THE. Their phyſic ſucceeded the Grecian; and their phyſicians handed down the art to us, having made conſiderable improvements, chiefly in the pharmaceutical and chemical parts. It is certain we owe to them moſt of our ſpices and aromatics, as nutmegs, cloves, mace, and other matters of the produce of India. We may add, that moſt of the gentler purgatives were unknown to the Greeks, and firſt introduced by the Arabs, as manna, ſenna, rhubarb, tamarinds, caſſia, &c. They likewiſe brought ſugar into uſe in phyſic, where, before, only honey was uſed. They alſo found the art of preparing waters and oils, of divers ſimples, by diſtillation and ſublimation. The firſt notice of the ſmall pox and the meaſles is likewiſe owing to them. The reſtoration of phyſic in Europe took its riſe from their writings. M. Le Clerc has given a ſketch, and Dr Freind an ample hiſtory, of the Arabian phyſic. We have alſo a notitia of all the Arabian phyſicians by Fabricius. Inoculation for the ſmall-pox has been in uſe from time immemorial among the Bedouins. Mothers perform this operation on their children, opening the ſkin of the arm with the prickle of a thorn.

(19.) ARABIANS, POETRY OF THE. Their poetry may be divided into two ages. The ancient, according to Voſſius, was no other than rhiming; was a ſtranger to all meaſure and rule; the verſes looſe and irregular, confined to no feet, number of ſyllables, or any thing elſe, ſo that they rhimed at the end; oftentimes all the verſes in the poem ended with the ſame rhime. It is in ſuch verſe that the Alcoran is ſaid to be written. The modern Arabian poetry takes its date from the khalifate of Al Raſchid, who lived toward the cloſe of the eighth century. Under him poetry became an art, and laws of proſody were laid down.—Their compariſons, in which they abound, are taken, with little choice, from tents, camels, hunting, and the ancient manners of the Arabs. Mr Niebuhr relates an anecdote which ſhews the high eſteem the Arabians have for poetical genius. "A ſchiech of Dsjof (he ſays) was, a few years ſince, impriſoned at Sana. The ſchiech, obſerving a bird upon the roof of a houſe, recollected the opinion of thoſe pious Muſſulmans, who think it a meritorious action to deliver a bird from a cage. He thought that he himſelf had as good a right to liberty as any bird, and expreſſed this in a poem, which his guards got by heart, and which becoming generally known, at length reached the monarch's ears, who was ſo pleaſed with it, that he ſet the ſchiech at liberty, although he had been guilty of various acts of robbery."

(20.) ARABIANS, RELIGIONS AMONG THE. The ancient religion of the Arabs, as well as of the Indians, conſiſted in the worſhip of the ſun, the moon, and the fixed ſtars; a primitive and ſpecious mode of ſuperſtition. Sabianiſm was early diffuſed over Aſia by the ſcience of the Chaldæans and the arms of the Aſſyrians. From the obſervations of 2000 years, the prieſts and aſtronomers of Babylon deduced the eternal laws of nature and providence. They adored the ſeven gods or angels who directed the courſe of the 7 planets, and ſhed their irreſiſtible influence on the earth. The attributes of the 7 planets, with the 12 ſigns of the zodiac, and the 24 conſtellations, were repreſented by images and taliſmans; the 7 days of the week were dedicated to their reſpective deities; the Sabians prayed thrice each day; and the temple of the moon at Haran was the term of their pilgrimage. But the flexible genius of the Sabian faith was always ready either to teach or to learn. The altars of Babylon were overturned by the Magians; but the injuries of the Sabians were revenged by the ſword of Alexander; Perſia groaned 500 years under a foreign yoke; and the pureſt diſciples of Zoroaſter eſcaped from the contagion of idolatry, and breathed with their adverſaries the freedom of the deſart. Seven hundred years before the death of Mahomet the Jews were ſettled in Arabia; and a far greater multitude was expelled from the holy land in the wars of Titus and Adrian. The induſtrious exiles aſpired to liberty and power: they erected ſynagogues in the cities and caſtles in the wilderneſs; and their Gentile converts were confounded with the children of Iſrael, whom they reſembled in the outward mark of circumciſion. The Chriſtian miſſionaries were ſtill more active and ſucceſsful: the Catholics aſſerted their univerſal reign; the ſects whom they oppreſſed ſucceſſively retired beyond the limits of the Roman empire, and fled to the *happy* Arabia, where they might profeſs what they believed, and practiſe what they profeſſed. The Marcionites and Manichæans diſperſed their *fantaſtic* opinions and apocryphal goſpels; the churches of Yemen, and the princes of Hira and Gaſſan, were inſtructed in a purer creed by the Jacobite and Neſtorian biſhops. Such was the ſtate of religion in Arabia, previous to the appearance of Mahomet. "It might be expected (ſays Mr Niebuhr) that the Mahometan religion ſhould be preſerved in its higheſt purity in Arabia, which was its cradle; and that no contrariety of opinions, or diverſity of ſects, ſhould have ariſen there. An old tradition records a ſaying of Mahomet's, from which he appears to have foreſeen that it was impoſſible for

for his followers to remain in perpetual harmony of doctrine and worſhip. He is ſaid to have predicted that his new religion ſhould be divided into ſeventy different ſects, as the Chriſtians of his time were." He adds, that this prediction is in part accompliſhed; there being many different Mahometan ſects in Arabia. Of theſe he enumerates 13, viz. thoſe of Sunni, Schya, Zeidi, Beiali, Meſſalich, Mecrami, Dsjedsjal, Schabreari, Merdinar, Schafei, Hanifa, Maleki, and Hanbali; of whom the Beiafites and the Zeidites appear to be the moſt liberal and tolerant, towards thoſe who differ from them: for the Muſſulmans in general do not perſecute thoſe of other religions. The Arabians have no hatred againſt thoſe of a different religion. They, however, regard them with much the ſame contempt with which Chriſtians look upon the Jews in Europe. Among the Arabs this contempt is regulated. It falls heavieſt upon the Banians; next upon the Jews; and, leaſt of all, upon the Chriſtians, who, in return, expreſs the leaſt averſion for the Muſſulmans. A Mahometan, who marries a Chriſtian or Jewiſh woman, does not oblige her to apoſtatize from her religion; but the ſame man would not marry a Banian female, becauſe this Indian ſect are ſuppoſed to be ſtrangers to the knowledge of God, having no book of divine authority. This progreſs towards general toleration preſerves the Arabs from the rage of making proſelytes.

(21.) ARABIANS, TRADE OF THE. Before the Portugueſe interrupted the navigation of the Red Sea, the Arabs were the factors of all the trade that paſſed through that channel. Aden, which is ſituated at the moſt ſouthern extremity of Arabia upon the Indian ocean, was the mart in theſe parts. The ſituation of its harbour, which opened an eaſy communication with Egypt, Ethiopia, India, and Perſia, had rendered it, for many ages, one of the moſt flouriſhing factories in Aſia. Fifteen years after it had repulſed the great Albuquerque, who attempted to demoliſh it in 1513, it ſubmitted to the Turks, who did not long remain maſters of it. The king of Yemen, who poſſeſſed the only diſtrict in Arabia that merits the title of *Happy*, drove them from thence, and removed the trade to Mocha, a place in his dominions which till then was only a village. This trade was at firſt inconſiderable; conſiſting in myrrh, incenſe, aloes, balm of Mecca, ſome aromatics, and medicinal drugs. Theſe articles, the exportation of which is continually retarded by exorbitant impoſts, and does not exceed at preſent 30,625l. were at that time more in repute than they have been ſince: but muſt have been always of little conſequence. Soon after a great change enſued from the introduction of coffee. Though this article is generally uſed in the Arabian entertainments, none but the rich citizens have the pleaſure of taſting the berry itſelf. The generality are obliged to content themſelves with the ſhell and the huſk of this valuable production. Theſe remains, ſo much deſpiſed, make a liquor of a pretty clear colour, which has a taſte of coffee without its bitterneſs and ſtrength. Theſe articles may be had at a low price at Betelfagui, which is the general market for them. Here likewiſe is ſold all the coffee which comes out of the country by land. The reſt is carried to Mocha, which is 35 leagues diſtant, or to the nearer ports of Lohia or Hodeida from whence it is tranſported in ſmall veſſels to Jodda. The Egyptians fetch it from the laſt mentioned place, and all other nations from the former. The quantity of coffee exported may be eſtimated at 12,550,000 weight. The European companies take off a million and a half; the Perſians three millions and a half; the fleet from Suez ſix millions and a half; Indoſtan, the Maldives and the Arabian colonies on the coaſt of Africa, 50,000; and the caravans a million. As the coffee which is brought up by the caravans and the Europeans is the beſt that can be procured, it coſts about 8½d. a pound. The Perſians, who content themſelves with that of an inferior quality, pay about 6½d. a pound. The Egypians purchaſe it at the rate of about 8d; their cargoes being compoſed partly of good and partly of bad coffee. If we eſtimate coffee at about 7½d. a pound, the profits accruing to Arabia from its annual exportation will amount to 384,343l. 15s. This money does not go into their coffers; but it enables them to purchaſe the commodities brought from the foreign markets to their ports of Jodda and Mocha. Mocha receives from Abyſſinia, ſheep, elephants teeth, muſk, and ſlaves. It is ſupplied from the eaſtern coaſt of Africa, with gold, ſlaves, amber, and ivory; from the Perſian gulf, with dates, tobacco and corn; from Surat, with a vaſt quantity of coarſe, and a few fine linens; from Bombay and Pondicherry, with iron, lead, and copper, which are carried thither from Europe; from Malabar, with rice, ginger, pepper, Indian ſaffron, coire, cardamom, and planks; from the Maldives, with gum, benzoin, aloes-wood, and pepper, which theſe iſlands take in exchange; from Coromandel, with 400 or 500 bales of cottons, chiefly blue. The greateſt part of thoſe commodities, which may fetch 262,500l. are conſumed in the interior part of the country. The reſt, particularly the cottons, are diſpoſed of in Abyſſinia, Socotora, and the eaſtern coaſt of Africa. None of the branches of buſineſs managed at Mocha, or throughout all the country of Yaman, or even at Sanaa the capital, are in the hands of the natives. The extortions with which they are perpetually threatened by the government deter them from interfering in them. All the warehouſes are occupied by the Banians of Surat or Guzaret, who return to their own country as ſoon as they have made their fortunes. The government of Jodda is of a mixed kind; the grand Signior and the Xeriff of Mocca ſhare the authority and the revenue of the cuſtoms between them.—Theſe impoſts are levied upon the Europeans at the rate of 8 per cent. and upon other nations at 13. They are always paid in merchandiſe, which the managers oblige the merchants of the country to buy at a very dear rate. The Turks, who have been driven from Aden, Mocha, and every part of the Yaman, would long ago have been expelled from Jodda, if there had not been cauſe to apprehend that they might revenge themſelves in ſuch a manner as to put an end to their pilgrimages and commerce. The coined money current at Mocha, the principal port in the Red Sea, is dollars of all kinds; but they abate 5 per cent. on the pillar dollar.

dollars, becauſe they are not pure ſilver. All their coins are taken by weight, and valued according to their purity. The gold coins current here are ducats of Venice, Germany, Turky, Egypt, &c. The comaſſes are a ſmall coin, which are taken at ſuch a price as the government ſets on them; and they keep their accounts in an imaginary coin, called *cabeers*, of which 80 go to a dollar. For an account of the ancient coins called DINARS and DIRHEMS, ſee theſe articles.

(22.) ARABIANS, VINDICTIVE SPIRIT OF THE. "A lively, animated people, of quick and violent paſſions, are naturally led to carry the deſire of vengeance for injuries to its higheſt exceſs. The vindictive ſpirit of the Arabs, which is common to them with the other inhabitants of hot climates, varies, however, with the varying modifications of the national character. The Arabs are not quarrelſome; but, when any diſpute happens to ariſe among them, they make a great deal of noiſe. Some of them, however, although armed with poignards, and ready to ſtab one another, are eaſily appeaſed. A reconciliation is inſtantly effected, if any indifferent perſon but ſay to them, "Think of God and his Prophet." But the moſt irritable of all men are the noble Bedouins, who, in their martial ſpirit, ſeem to carry thoſe ſame prejudices farther than even the barbarous warriors who iſſued from the north, and over-ran Europe. Bedouin honour is ſtill more delicate than ours, and requires even a greater number of victims to be ſacrificed to it. If one Schiech ſays to another, with a ſerious air, "Thy bonnet is dirty," or, "The wrong ſide of thy turban is out," nothing but blood can waſh away the reproach; and not merely the blood of the offender, but that alſo of all the males of his family." Mr Niebhur relates a ſhocking inſtance of this, which happened about a dozen of years before he travelled in Arabia, in the neighbourhood of Barra, and which may afford an idea of the exceſs to which the ſpirit of revenge often riſes among this nation. "A man of eminence, belonging to the tribe of *Montefadſi*, had given his daughter in marriage to an Arab of the tribe of *Korne*. Shortly after the marriage, a Schiech of an inferior tribe aſked him, in a coffee-houſe, Whether he were father to the handſome young wife of ſuch a one, whom he named? The father, ſuppoſing his daughter's honour ruined, immediately left the company to *ſtab* her! At his return from the execution of this inhuman deed, he who had ſo indiſcreetly put the queſtion was gone. Breathing nothing now but vengeance, he ſought him every where; and not finding him, killed in the mean time ſeveral of his relations, without ſparing even his cattle or ſervants. The offender offered the governor of Korne a great ſum if he would rid him of ſo furious an adverſary. The governor ſent for him who had been offended, and endeavoured by threats, and a ſhew of the apparatus of puniſhment, to force him to a reconciliation; but the vengeful Arab would rather meet death than forego his revenge. Then the governor, to preſerve a man of ſuch high honour, ſoothed him to an agreement, by which the firſt aggreſſor gave his daughter, with a handſome portion, in marriage to him whom he had offended! But the father-in-law durſt never after appear before his ſon-in-law. The thirſt for vengeance diſcovers itſelf likewiſe in the peculiar manner in which murder is proſecuted here. In the high country of Yemen, the ſupreme court of Sana commonly proſecutes murderers in the mode uſual in other countries; but, in ſeveral diſtricts in Arabia, the relations of the deceaſed have leave either to accept a compoſition in money, or to require the murderer to ſurrender himſelf to juſtice, or even to wreck their vengeance upon his whole family. In many places, it is reckoned unlawful to take money for the ſhedding of blood, which, by the laws of Arabian honour, can be expiated only by blood. They think little of making an aſſaſſin be puniſhed, or even put to death, by the hand of juſtice; for this, (they think) would be to deliver a family from an unworthy member, who deſerved no ſuch favour at their hands. For theſe reaſons, the Arabs rather revenge themſelves, as law allows, upon the family of the murderer, and ſeek an opportunity of flaying its head, or moſt conſiderable perſon, whom they regard as being properly the perſon guilty of the crime, as it muſt have been committed through his negligence in watching over the conduct of thoſe under his inſpection. In the mean time, the judges ſeize the murderer, and detain him till he has paid a fine of 200 crowns. Had it not been for this fine, ſo abſurd a law muſt have been long ſince repealed. From this time, the two families are in continual fears, till ſome one or other of the murderer's family be ſlain. No reconciliation can take place between them, and the quarrel is ſtill occaſionally renewed. There have been inſtances of ſuch family feuds laſting 40 years. If, in the conteſt, a man of the murdered perſon's family happen's to fall, there can be no peace till two others of the murderer's family have been ſlain. This deteſtable cuſtom is ſo expreſsly forbidden in the Koran, that I ſhould not have been perſuaded of its exiſtence, had I not ſeen inſtances of it. Men, indeed, act every where in direct contradiction to the principles of religion; and this ſpecies of revenge is not merely impious, but even abſurd and inhuman. An Arabian of diſtinction, who often viſited us at Loheya, always wore, even when he was in company, both his poignard and a ſmall lance. The reaſon of this, he told us, was, that a man of his family had been murdered, and he was obliged to avenge the murder upon a man of the inimical family, who was then actually in the city, and carried juſt ſuch another lance. He acknowledged to us, that the fear of meeting his enemy, and fighting with him, often diſturbed his ſleep."

ARABIC, ſomething that relates to Arabia, or the Arabians.

ARABIC CHARACTERS. See ARABIAN ALPHABET.

ARABIC FIGURES, are the ten numeral characters commonly made uſe of in arithmetical computations; in diſtinction from the Roman numeral letters. The learned are generally of opinion, that the Arabic figures were firſt taught us by the Saracens, who borrowed them from the Indians. —Scaliger was ſo ſatisfied of their novelty, that he pronounced a ſilver medallion he was conſulted about, modern, upon his being told that the numeral

ral figures 234, 235, were upon it. The common opinion is, that Planudes, who lived towards the close of the 13th century, was the first Christian who made use of them. Father Mabillon even assures us, in his work *de Re Diplomatica*, that he has not found them any where earlier than the 14th century. Yet Dr Wallis insists of their being of a much older standing; and concludes they must have been used in England, at least as long ago as the time of Hermannus Contractus, who lived about the year 1050, if not in ordinary affairs, yet at least in mathematical ones, and particularly in the astronomical tables. The same author gives us an instance of their antiquity in England, from a mantle-tree of a chimney, in the parsonage house of Helmdon in Northamptonshire, wherein is the following inscription *in basso relievo*. N° 133, being the date of the year 1133. Mr Luffkin furnishes a yet earlier instance of their use, in the window of a house, part of which is a Roman wall, near the market place in Colchester; where between two carved lions, stands an escutcheon, containing the figures 1090. *Philos. Transf.* N° 154, 255. Mr Huet is even of opinion, that these characters were not borrowed from the Arabs, but from the Greeks; and that they were originally no other than the Greek letters, which that people made use of to express their numbers.

ARABIC GUM. See GUM, ARABIC.

ARABIC TONGUE, a branch or dialect of the Hebrew. F. Angelo de St Joseph speaks much of the beauty and copiousness of the Arabic. He assures us it has no less than 1000 names for a sword; 500 for a lion; 200 for a serpent; and 80 for honey! Such a superfluity of words seems to be rather a fault than a beauty. See ARABIANS, § 11.

ARABIC VERSIONS. See BIBLES.

ARABIC YEAR. See YEAR.

ARABICI, a sect who sprung up in Arabia, about A. D. 207, whose distinguishing tenet was, that the soul died with the body, and also rose again with it. Eusebius relates, that a council was called to stop the progress of this rising sect; and that Origin assisted at it; and convinced them so thoroughly of their error that they abjured it

ARABICUS COSTUS. See COSTUS.

ARABICUS SINUS, the Red Sea.

ARABIS, BASTARD TOWER-MUSTARD: A genus of the siliquosa order, belonging to the tetradynamia class of plants; and in the natural method ranking under the 39th order, *Siliquosæ*. The generic marks consist in 4 nectiferous glands which lie on the inside of each leaf of the calyx. There are 8 species; but none of them remarkable for their beauty or their properties. Only one of these, viz.

ARABIS THALIANA, or the mouse-ear, is a native of Britain. It is a low plant, seldom rising more than 4 or 5 inches high, branching on every side, having small white flowers growing alternately, which have each four petals in form of a cross, that are succeeded by long slender pods filled with small round seeds. It grows naturally on sandy ground or old walls. Sheep are not fond of it, and swine refuse it.

ARABISM, or ARABISMUS, an idiom or manner of speaking peculiar to the Arabs, or the Arabic language.

ARABIST, a person curious of, and skilled in, the learning and languages of the Arabians; such were Erpenius and Golius. The surgeons of the 13th century are called Arabists by Severinus.

* ARABLE. *adj.* [from *ara*, Lat. to plow.] Fit for the plough; fit for tillage; productive of corn.

'Tis good for *arable*, a glebe that asks
Tough teams of oxen, and laborious tasks. *Dryd.*

Having but very little *arable* land, they are forced to fetch all their corn from foreign countries. *Addis.*

ARABLE LAND, anciently called ARALIA, [from *arare*, to plow,] for tillage, or ploughing; or which has been ploughed up.

ARABO, or RAAB, one of the principal rivers in Hungary, which rises in the Marquisate of Stiria, and discharges its waters into the Danube.

ARABS, or ARABIANS, the natives of Arabia. See ARABIA, § 5, and ARABIANS, § 1—22.

ARABS, WANDERING. See BEDOUINS.

ARABUM LEPRA, the leprosy.

ARABUM SANDARACHA. See SANDARACHA.

ARAC. See ARACK.

ARACAN, or RECCAN, the capital of a small kingdom, NE. of the Bay of Bengal. It has the conveniency of a spacious river, and a harbour large enough to hold all the ships in Europe. It is said by Schouten to be as large as Amsterdam; but the houses are slight, being made with palm trees and bamboo canes, and covered with leaves of trees. They are seldom above six feet high, but have many windows or air holes. But the people of the highest rank are much better accommodated. They have no kitchens, chimneys, or cellars, which obliges the women to dress the victuals out of doors. Some of the streets are on the ridges of rocks, wherein are a great many shops. Their orchards and gardens contain all the fruit common to the Indies, and their trees are green all the year. Their common drink is toddy; which is the sap of the cocoa tree, and when new, will intoxicate like wine, but soon grows sour. Elephants and buffaloes are very numerous here, and are made use of instead of horses. Flocks of sheep and herds of cattle are also numerous near Aracan. The country produces great quantities of rice, and the water is good. They have plenty of provisions, but little trade; for when Mr Channoch was here in 1686, with six large ships, there was nothing to be had in the way of commerce; and yet the country produces lead, tin, stick-lac, and elephants teeth. The Mogul's subjects come here to purchase these commodities, and sometimes meet with diamonds, rubies, and other precious stones. They were formerly governed by a king of their own, called the king of the *White Elephant*: but this country has been conquered by the king of Pegu. They pay little or no regard to the chastity of their women, and the common sailors take great liberties among them. Their religion is paganism; and the idol-temples, and priests, are very numerous. The dress of the superior class is very slight, for it consists chiefly of a piece of white cotton over their arms, breast, and belly, with an apron before. The complexion of the women is tolerable; they wear thin flowered gauze over their breast and shoulders, and a piece of cotton, which they roll three or four times round their waist, and let it hang

hang as low as their feet. They curl their hair, and put glaſs rings in their ears, and ſtretch them of a monſtrous length. On their arms and legs they have hoops of copper, ivory, ſilver, &c. Captain Hamilton ſays, that there are but few places inhabited, on account of the great number of wild elephants and buffaloes which would deſtroy the fruits of the ground; and that the tigers would deſtroy the tame animals. There are ſome iſlands near the ſea, inhabited by a few poor fiſhermen. The rich burn their dead bodies; but the poor, who are not able to buy wood, throw them into the river. Lon. 93. 16. E. Lat. 20. 6. N.

ARACARI, in ornithology, the name of a Braſilian bird of the woodpecker kind. It is of the ſize of our common green woodpecker, and has a very large, ſharp, and ſomewhat hooked beak. See PICUS.

To ARACE. *v. a.* To deface to pluck up. (*Obſ.*) *Bailey.*

ARACHIS, in botany, a genus of the diadelphia order, belonging to the decandria claſs of plants; and, in the natural method, ranking under the 32d order, Papilionaceæ. There is only one ſpecies, viz.

ARACHIS HYPOGEA, an annual plant, and a native of Braſil and Peru. The ſtalks are long, trail upon the ground, and are furniſhed with winged leaves, compoſed of 4 hairy lobes each. The flowers are produced ſingly on long peduncles; they are yellow, of the pea kind, and each contains ten awl-ſhaped ſtamina, nine of which are tied together, and the upper one ſtands off. In the centre is an awl-ſhaped ſtylus, crowned with a ſimple ſtigma. The germen is oblong, and becomes an oval oblong pod, containing two or three oblong blunt ſeeds.—This plant is cultivated in all the American ſettlements for the ſeeds, which make a conſiderable part of the food of the ſlaves. The manner of perfecting them is very ſingular: for as the flowers fall off, the young pods are forced into the ground by a natural motion of the ſtalks, and there they are entirely buried, and not to be diſcovered without digging for them; whence they have obtained the name of *ground nuts*.

ARACHNE, in fabulous hiſtory, a young maid of Lydia, the daughter of Idmon, ſaid to have been the inventreſs of ſpinning. She is fabled to have been ſo ſkilful in this art, as to have challenged Minerva at it; who tore her work, and ſtruck her; which diſgrace driving her to deſpair, ſhe hanged herſelf. Minerva, from compaſſion brought her to life, and transformed her into a ſpider, which ſtill employs itſelf in ſpinning.

(1.) * ARACHNOIDES. *n. ſ.* [from ἀράχνη, a ſpider, and εἶδος, form.] 1. One of the tunicks of the eye, ſo called from its reſemblance to a cobweb.—As to the tunicks of the eye, many things might be taken notice of; the prodigious fineneſs of the *arachnoides*, the acute ſenſe of the retina. *Derham.* 2. It is alſo a fine thin tranſparent membrane, which, lying between the dura and the pia mater, is ſuppoſed to inveſt the whole ſubſtance of the brain. *Chambers.*

(2.) ARACHNOIDES is alſo an appellation given to one of the coverings of the ſpinal marrow. See ANATOMY, INDEX.

(3.) ARACHNOIDES, in natural hiſtory, the name of one of the genera of the *echini marini*; the diſtinguiſhing characters of which are, that it is of a circular circumference, but variouſly broken in at the edges. The mouth is round, and placed in the centre of the baſe, and the aperture for the anus is quadrangular, and ſituated in one of the ſides, on the upper ſuperfices, but near the edge.

(4.) ARACHNOIDES, a ſpecies of madrepora, found foſſil: the ſtars are very ſmall, crowded, and flattened; the rays undulated, ſhort, and equal.

(1. 1.) ARACK, ARRACK, or RACK, a ſpirituous liquor imported from the Eaſt Indies, uſed by way of dram and in punch. The word arack, according to Mr Lockyer, is an Indian name for ſtrong waters of all kinds; for they call our ſpirits and brandy Engliſh arack. But what we underſtand by the name arack, he affirms is really no other than a ſpirit procured by diſtillation from a vegetable juice called *toddy*, which flows by inciſions out of the cocoa-nut tree, like the birch juice procured among us. The toddy is a pleaſant drink by itſelf, when new, and purges thoſe who are not uſed to it; when ſtale, it is heady, and makes good vinegar. The Engliſh at Madras uſe it as leaven to raiſe their bread with.

(2.) ARACK, DIFFERENT KINDS OF. There are ſeveral kinds of arack diſtinguiſhed by different names, either from the places, where they are made, or from their colour or quality: ſuch as,

1. ARACK, BATAVIA, is ſaid to be a vinous ſpirit obtained by diſtillation from rice and ſugar fermented with the juice of cocoa nuts. It is a ſtrong ſpirit, but being made in copper ſtills, is not ſo agreeable as the Goa arack.

2. ARACK, BITTER. } Theſe two kinds are lit-
3. ARACK, BLACK. } tle known in Europe.

4. ARACK, COLUMBO, is a hot ſpirit, little valued and ſeldom imported by Europeans.

5. ARACK, GOA, is ſaid to be made from the toddy, (See § 1.) and there is likewiſe a kind of ſhrub from which it is made. Goa and Batavia are the chief places for arack.—At Goa there are divers kinds; ſingle, double, and treble diſtilled. The double diſtilled, which is that commonly ſent abroad, is but a weak ſpirit in compariſon with Batavia arack; yet, on account of its peculiar and agreeable flavour, is preferred to all the other aracks of India. This flavour is attributed to the earthen veſſels uſed at Goa to draw the ſpirit; whereas at Batavia they uſe copper ſtills. In the beſt Goa arack, the ſpirits of the cocoa juice do not make above a 6th or an 8th part. See § 3.

6. ARACK, PARIER, is made at Madras; and

7. ARACK, QUILONE, at Quilone: They are both fiery ſpirits, little valued by the Europeans, and therefore rarely imported; though highly prized among the natives.

(3.) ARACK, METHOD OF MAKING. The manner of making the Goa arack is this: The juice of the trees is not procured in the way of tapping, as we do; but the operator provides himſelf with a parcel of earthen pots, with bellies and necks like our ordinary bird bottles; he makes faſt a number of theſe to his girdle, and any way elſe that he commodiouſly can about him. Thus equipped, he climbs up the trunk of a cocoa tree; and when he comes to the boughs, he takes out his knife, and cutting off one of the ſmall knots

or buttons, he applies the mouth of the bottle to the wound, fastening it to the bough with a bandage; in the same manner he cuts off other buttons, and fastens on his pots, till the whole number is used: this done in the evening, and descending from the tree, he leaves them till the next morning; when he takes off the bottles, which are mostly filled, and empties the juice into the proper receptacle. This is repeated every night, till a sufficient quantity is produced; and the whole being then put together, is left to ferment, which it soon does. When the fermentation is over, and the liquor or wash becomes a little tart, it is put into the still, and a fire being made, the still is suffered to work as long as that which comes over has any considerable taste of spirit. The liquor thus procured is the low wine of arack; and this is so poor a liquor that it will soon corrupt and spoil, if not distilled again, to separate some of its phlegm; they therefore immediately after pour back this low wine into the still, and rectify it to that very weak kind of proof-spirit, in which state we find it. The arack we meet with, notwithstanding its being a proof test, according to the way of judging by the crown of bubbles, holds but a sixth, and sometimes but an eighth part of alcohol or pure spirit; whereas our other spirits, when they show that proof, are generally esteemed to be one half pure spirit. There is a paper of observations on arack, in the *Melanges d'Histoire Natur. tome* v. p. 302. By fermenting, distilling, and rectifying the juice of the American maple, which has much the same taste as that of the cocoa, the author says he made arack not in the least inferior to any that comes from the East Indies; and he thinks the juice of the sycamore and of the birch trees would equally answer the end.

(4.) ARACK, STATUTES RESPECTING. By stat. 11th Geo. I. c. 30. arack on board a ship, within the limits of any port of Great Britain, may be searched for and seized, together with the package; or if found unshipping or unshipped, before entry, may be seized by the officers of excise, in like manner as by the officers of the customs.—Upon an excise officers suspicion of the concealment of arack, and oath made of the grounds of such suspicion before the commissioners or a justice of peace, they may empower him to enter such suspected places, and seize the liquors, with the casks, &c. If the officers are obstructed, the penalty is 100l. Arack is not to be sold but in warehouses, entered as directed in the 6th of Geo. I. cap. 21. upon forfeiture, and casks, &c. If permits are not returned which are granted for the removal of arack, or if the goods are not sent away within the time limited, the penalty is treble the value. If the permits are not retained, and the decrease is not found to be sufficient, the like quantity is forfeited. Permits are not to be taken out but by direction in writing of the proprietor of the stock, or his known servant, upon forfeiture of 50l. or three months imprisonment. By stat. 9th, Geo. II. c. 35. if arack is offered to sale without a permit, or by any hawker, pedlar, &c. with a permit, the person to whom it is offered may seize and carry it to the next warehouse belonging to the customs or excise, and bring the person offering the same before any justice of the peace, to be committed to prison, and prosecuted for the penalties incurred by such offence. The person seizing such goods may prosecute in his own name; and on recovery is entitled to one-third part of the gross produce of the sale; and the commissioners are, if desired, upon a certificate from the justice of the offender's being committed to prison, to advance to the seizer 15s. per gallon for the arack so seized. Arack (except for the use of seamen, two gallons each) found in any ship or vessel arrived from foreign parts, at anchor, or hovering within the limits of any port, or within two leagues of the shore; and not proceeding on her voyage (unless in case of unavoidable necessity and distress of weather, notice thereof must be given to the collector or chief officer of the port upon the ship's arrival,) is forfeited, with the boxes, casks, or other package, or the value thereof.

(II.) ARACK, TUNGUSIAN, is a spirituous liquor made by the Tartars of Tungusia, of mare's milk, left to sour, and afterwards distilled twice or thrice between two earthen pots closely stopped, whence the liquor runs through a small wooden pipe. It is more intoxicating than brandy.

ARACTHUS, a river of ancient Epirus, on which AMBRACHIA was seated, now called *Spagnamurisi*.

(1.) ARACUS, in botany, wild vetch. See VICIA.

(2.) ARACUS AROMATICUS, in the materia medica, a name given by some authors to the vanilla used in making chocolate.

(1.) ARAD, a king in the S. of Canaan. The Israelites having advanced towards the land of Canaan (Num. xxi. 1,) Arad opposed their passage, defeated them, and took a great booty from them; but they destroyed his country as soon as they became masters of Canaan.

(2.) ARAD, in ancient geography, a city of Arabia Petræa, lying S. of Judah. Eusebius places it in the neighbourhood of Kades, at the distance of 20 miles from Hebron.

(3, 4.) ARAD, in modern geography, a district and town of Hungary.

ARADOS, a word used by Hippocrates, for that perturbation which is excited in the stomach by concocting meats of different qualities. *Aradus* also signifies any internal perturbation caused by purging medicines, vehement exercise, &c.

(1.) ARADUS, in ancient geography, an island between Phœnicia and Seleucis, 20 stadia from a dangerous coast. It was a rock surrounded by the sea, in compass seven stadia; and formerly a very powerful city and republic. It is now called Romad; but not a single wall is remaining of all that multitude of houses which, according to Strabo, were built with more stories than even those of Rome. The liberty enjoyed by the inhabitants had rendered it very populous; and it subsisted by naval commerce, manufactures, and arts. At present the island is deserted; nor has tradition even retained the memory of a spring of fresh water in its environs, which the people of Aradus discovered at the bottom of the sea, and from which they drew water in time of war, by a leaden bell and a leathern pipe fitted to its bottom.

(2.) ARADUS. See ARVAD.

ARÆ, two rocks in the bay of Carthage. See ÆCIMURUS.

ARÆOMETER, [from ἀραιὸς, thin, and μέτρον, meaſure,] an inſtrument wherewith to meaſure the denſity or gravity of fluids. The aræometer, or water-poiſe, is uſually made of glaſs; conſiſting of a round hollow ball, which terminates in a long ſlender neck hermetically ſealed at top; there being firſt as much running mercury put into it as will ſerve to balance or keep it ſwiming in an erect poſition. The ſtem is divided into degrees, as repreſented Plate XII. fig. 23.; and by the depth of its deſcent into any liquor, the lightneſs of that liquor is concluded: for that fluid in which it ſinks leaſt muſt be heavieſt; and that in which it ſinks loweſt, lighteſt. M. Homberg has invented a new aræometer, deſcribed in *Phil. Tranſact.* N° 262. thus: *A* is a glaſs bottle or matraſs, with ſo ſlender a neck that a drop of water takes up in it about five or ſix lines, or half of an inch. Near that neck is a ſmall capillary tube *D*, about ſix inches long, and parallel to the neck.—To fill the veſſel, the liquor is poured in at the mouth *B*, (which is widened to receive a tunnel,) till it run out at *D*, that is, till it riſe in the neck to the mark *C*, by which means you have always the ſame bulk or quantity of liquor; and conſequently, by means of the balance, can eaſily tell, when different liquors fill it, which weighs moſt, or is moſt intenſely heavy. Some regard, however, is to be had in theſe trials to the ſeaſon of the year and degree of heat and cold in the weather; becauſe ſome liquors rarefy with heat and condenſe with cold more than others, and accordingly take more or leſs room. See HYDROMETER. By means of this inſtrument, which weighs when empty 1 dram 28 grains, the ingenious author has made a table to ſhow the different weights of the ſame bulk of the moſt conſiderable chemical liquors both in ſummer and winter, as follows:

	Weighed in ſummer. oz. dr. gr.	In winter. oz. dr. gr.
The ARÆOMETER full of Quickſilver,	11 0 6	11 0 32
Oil of tartar,	1 3 8	1 3 31
Spirit of urine,	1 0 32	1 0 43
Oil of vitriol,	1 3 58	1 4 03
Spirit of nitre,	1 1 40	1 1 70
Spirit of ſalt,	1 0 39	1 0 47
Aquafortis,	1 1 38	1 1 55
Vinegar,	0 7 55	0 7 60
Spirit of wine,	0 6 47	0 6 61
River water,	0 7 53	0 7 57
Diſtilled water,	0 7 50	0 7 54

ARÆOPAGUS. See AREOPAGUS.

ARÆOPAGITIC. See AREOPAGITIC.

ARÆOSTYLE, [from ἀραιὸς, and στῦλος, a column,] in architecture, a term uſed by Vitruvius, to ſignify the greateſt interval between columns.

ARÆOTICS, in medicine, remedies which rarefy the humours, and render them eaſy to be carried off by the pores of the ſkin, ſuch as ſudorifics, &c.

ARÆ PHILÆNON, or ARÆ PHILÆNORUM, altars, according to Strabo, S. of Syrtis Major, but according to Peutinger, more weſterly, and S. almoſt of the Syrtis Minor. In Strabo's time, the altars were not extant, but a village of the ſame name ſtood on the ſpot. On a diſpute about limits, between the Cyreneans and Carthaginians, it was agreed that two of each people ſhould ſet out on the ſame day, and that where they ſhould happen to meet, there the limits of both ſhould be fixed. The Philæni, two brothers, Carthaginians, undertook it for Carthage: theſe, after having advanced many miles into the territory of the Cyreneans, were met by their antagoniſts; who, enraged at their being beforehand with them ſo far, gave them the option of their returning back, or of being buried alive on the ſpot. Like zealous patriots, they choſe the latter; and there the Carthaginians raiſed two altars, in honour of the Philæni.

ARAF. See ALARAF.

ARAFAH, the ninth day of the laſt month of the Arabic year, named *Dhulhegiat*; on which the pilgrims of Mecca perform their devotions on the mountain ARAFAT. See next article.

ARAFAT, or GIBEL EL ORPHAT, *the mountain of knowledge*, a mountain in Arabia, near Mecca. The Mahometans ſay this was the place where Adam firſt met and knew his wife Eve, after they had been expelled from Paradiſe, and ſeparated from each other 120 years! This mountain not being large enough to contain all the devotees that come annually in pilgrimage to Mecca, ſtones are ſet up all round it, to ſhow how far it reaches. The pilgrims are clad in robes of humility and mortification, with their heads uncovered. They ſeem to be very much affected; the tears flow down their cheeks, and they ſob and ſigh moſt bitterly, begging earneſtly for remiſſion of ſins, and promiſing to lead a new life. They continue about 4 or 5 hours, and at half an hour after ſun ſet, they decamp to perform a religious duty, called *Aſſham nomas*. After this, they all receive the honourable title of *hadgees*, which is conferred upon them by the imam or prieſt. This being pronounced, the trumpet ſounds, and they all return to Mecca.

ARAGE, average. *Bailey.*

ARAGNISS, a ſmall town in Northumberland.

ARAGON. See ARRAGON, N° 1, and 2.

ARAGONA, a principality of Italy, in the Val di Mazara, belonging to Sicily.

ARAGUIES, a people of Brazil.

ARAHUM, or HARAHUM, in ancient writers, denotes a place conſecrated or ſet apart for holy purpoſes. Hence the phraſe in *arabo jurare*, or *conjurare*, "to make oath in the church;" becauſe, by the Ripuarian laws, all oaths were to be taken in the church, on the relics of the ſaints!

(1.)* ARAIGNEE. *n. f.* [Latin.] A term in fortification, which ſometimes denotes a branch, return, or gallery of a mine. *Dict.*

(2.) ARAIGNEE, or ARAINE, a ſpider. *Bailey.*

ARAIRE, a ſmall plough uſed in Provence and Languedoc, in France.

ARAIS ALNIL, in botany, the name given by the people of Egypt, to the *faba Egyptia*, or heads of the nilufar.

ARAISED, raiſed. *Chauc.*

ARAL, a great lake in the kingdom of Khowarazm, lying a little to the eaſtward of the Caſpian ſea. Its length from N. to S. is ſaid to be near 150 miles, and its breadth from E. to W. about 70. Mr Walker, in his Univerſal Gazetteer, deſcribes it as 300 miles long, and in ſome places

150 broad; and places it 700 miles east of the Caspian sea; between 58° and 62° Lon. E. and between 42° and 47° Lat. N. The shore on the W. side is high and rocky, and destitute of good water: yet there are abundance of wild horses, asses, antelopes, and wolves, and a fierce creature called a *jolbart*, which, the Tartars say, is of such a prodigious strength, as to carry off a horse. Several great rivers, which were supposed to run into the Caspian sea, are now known to fall into this lake, particularly the Sihun or Sirr, and the Gihun or Amo, so often mentioned by the Oriental historians. This lake, like the Caspian sea, has no visible outlet. Its water is also very salt; and for that reason, is conveyed by the neighbouring inhabitants, by small narrow canals, into sandy pits, where the heat of the sun, by exhaling the water, leaves them a sufficient quantity of salt. The same kinds of fish are found in Aral, that are found in the Caspian sea. It is also called the LAKE OF EAGLES.

(I.) ARALIA, in ancient law writers, arable lands. They are also denominated *aratoria*, and *araturia*. In Domesday for Essex, we meet with *decem acras prati, duos runcal. quatuor aralia*; where ARALIA seems to denote land fit for ploughing or tillage, in contradistinction to *runcalia*, which was over-run with briars and thorns.

(II.) ARALIA, in botany, the ANGELICA TREE. A genus of the pentagynia order, belonging to the pentandria class of plants; and in the natural method, ranking under the 46th order, Hederaceæ. The essential characters are: The involucrum is an umbella; the calyx is quinquedentated, and above the fruit; the corolla consists of five petals; and the berry has five seeds. There are five species of aralia, all natives of the Indies: The principal are,

1. ARALIA NUDICAULIS, having a stalk. This grows 3 or 4 feet high; the leaves have two large trifoliated lobes, which are sawed on their edges. The flower stalks arise between these, immediately from the root, and are terminated by round umbels of small four leaved flowers, of a whitish colour. The roots of this species were brought over from North America, and sold here for sarsaparilla, and is used as such, by the inhabitants of Cana; though very different from the true sort.

2. ARALIA SPINOSA, with a prickly stem, is a very ornamental shrub, and a native of Virginia. The height to which this tree will grow, if the soil and situation wholly agree with it, is about 12 feet; and the stem, which is of a dark brown colour, is defended by sharp spines, which fall off: even the leaves, which are branching, composed of many wings, and of a pleasant green colour, have these defenders; which are crooked and strong, and stand as guards to them till the leaves fall off in the autumn. The flowers are produced in large umbels from the ends of the branches: They are of a greenish yellow colour; and their general characters indicate their structure. They make their appearance in the end of July or beginning of August; but are not succeeded by ripe seeds in our gardens.

(III.) ARALIA SPINOSA, PROPAGATION AND CULTURE OF THE. This tree will *spawn*, as the gardeners call it; i. e. after digging among the roots, young plants will arise, the broken roots sending forth fresh stems: nay, if the roots are planted in a warm border, and shaded in hot weather, they will sometimes grow; but if planted in pots, and assisted by a moderate warmth of dung, or tanner's bark, they will be pretty sure of success; so that the propagation of this tree is very easy. But the general method of propagating it, and by which the best plants may be had, is from seeds, which must be procured from America, for they do not ripen in Britain; and, after having obtained them, they must be managed in the following manner: The time that we generally receive them is in the spring; when we must be furnished with a sufficient number of large pots. These must be filled with fine mould, taken from a rich border. The seeds must be sown in these pots, as soon as possible after their arrival, hardly half an inch deep, and then the pots should be plunged in a warm place, their whole depth in the soil. Care must be taken to break the mould in the pots, and water them as often as it has a tendency to crust over; and if they are shaded in hot weather, the plants will frequently come up the first summer. But in any case the pots should be plunged in a shady place; for they will flourish after that better in the shade; and the design of plunging them in a warm place at first was only with a view of setting the powers of vegetation at work, that, having natural heat, artificial shade also may be given them, and water likewise, the three grand necessaries for the purpose. The pots, whether the plants are come up in them or not, should be removed into shelter in October, either into a green house, some room, or under a hotbed frame; and in the spring, when all danger of frost is over, they should be plunged into the natural ground their own depth in a shady place. Those that were already come up will have shot strong by the autumn following; and if none of them have appeared, they will come up now. Whether they are young seedlings, or small plants of a former summer's growth, they must be kept clean of weeds, and watered in the time of drought, until autumn. In October they must be again removed, either into a greenhouse, &c. as before, or fixed in a warm place, and hooped, that they may be covered with mats in frosty weather. In the end of March following, they should be planted in the nursery way, to gain strength before they are finally planted out. The ground for this purpose, besides the natural shelter, should have a reed hedge, or something of the like nature, the more effectually to prevent the piercing winds from destroying the young plants. In this place, the plants may be set in rows; in each of which, furze bushes should be stuck the whole length; and all these together will ensure their safety. But here one caution is to be observed; not to stick the furze so thick, but that the plants may enjoy the free air in mild weather, and not to take them away too early in spring, lest, being kept warm the whole winter, and being deprived of their protection, a cutting frost should happen, as it sometimes does even in April or May, and destroy them. Weed and water them in dry weather in summer. They may be guarded again with furze bushes in the winter; though it wi

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not be neceſſary to do it in ſo cloſe a manner; and with this care, ſtill diminiſhing in proportion the number of furze buſhes, they may continue for three or four years, when they may be planted out into the warmeſt parts of the plantation.—With this management, theſe plants will be inured to bear our winters in well ſheltered places. The ſpines which grows on the branches and the leaves admoniſh us, for our own ſafety, not to plant this tree too near the ſides of walks.

ARALIASTRUM, in botany, ginſeng.

(I, 1.) ARAM, [רם, i. e. highneſs,] a name pretty common among the patriarchs: e. g. 1. The 5th ſon of Shem, father of the Aramites, the founder of Aram; (See N° II.) 2. the ſon of Kemuel, and grandſon or Nahor, Abraham's brother; and 3. ARAM, or RAM, the ſon of Hezron and great-grandſon of Judah.

(2.) ARAM, Eugene, a native of Yorkſhire, in England, who though very ſcantily educated by his parents, through natural genius and induſtrious perſeverance, acquired a conſiderable knowledge of the mathematics, and of the Latin, Greek, Hebrew, and Chaldee languages. In 1744, he acted as a teacher of Latin and writing at a ſchool in London, where he continued two years, and afterwards became aſſiſtant in a boarding ſchool at Hayes, in Middleſex. Some time after he was employed in tranſcribing the acts of parliament to be regiſtered in chancery; and in 1757, aſſiſted in the free ſchool at Lynn. About this time he ſtudied hiſtory, antiquity, and heraldry, and alſo botany. Beſides which, he was no bad poet. How lamentable is it, that a man poſſeſſing ſuch talents, ſhould have degraded himſelf by committing the moſt atrocious of all crimes! In 1758 he was apprended at Lynn, for murdering one Daniel Clarke, 13 years before, and carried to York caſtle. At his trial, in Auguſt 1759, he made a very able defence, but was found guilty; and next morning confeſſed the crime, but ſaid, a jealouſy of Clarke having criminal intercourſe with his wife, prompted him to it. When his irons were taken off, his arm was found cut in two places with a razor; and he was taken thus to the gallows at York, and hanged.

(II.) ARAM, or the ARAMÆAN REGION, } in ancient geography, the Hebrew name of Syria, ſo called from the ſon of Shem; ſee N° I. Nor was this name of ancient Syria confined to the Hebrews; for it is remarkable that Heſiod and Homer, two of the moſt ancient Greek authors extant, call the Syrians, ARAMÆANS. Aram accordingly made a part of ſeveral diviſions of ancient Syria: ſuch as,

1. ARAM BETH-REHOB, that part of Syria which lay to the N. of Paleſtine; becauſe Rehob was its boundary towards that quarter. It was allotted to the tribe of Aſher, where it joins Sidon.

2. ARAM-DAMMESEK, or Syria Damaſcena, a principal part of Syria, which took its name from Damaſcus, the principal city.

3. ARAM-MAACHA, a diſtrict of Syria, at the foot of mount Hermon, on the borders of the half tribe of Manaſſah, on the other ſide the Jordan, called the coaſt of Maachathi.

4. ARAM-NAHARAIM, i, e. Aram, or Syria of the Rivers, or Meſopotamia, ſituated between the Euphrates and Tigris; whence the name.

5. ARAM-SOBA, } the country which David con-
ARAM-ZOBAH, } quered, was ſituated where Palmyra afterwards ſtood. The Euphrates bounded it on the E. Canaan and Syria Damaſcena on the W.

ARAMÆANS, } the ancient inhabitants of Sy-
ARAMITES, } ria. See ARAM, N° I. and II.

ARAMONT, a town of France, in the department of Garde, ſeated on the Rhone, 5 miles W. of Avignon, and 20 SE. of Uzes. Lon. 5. 0. E. Lat. 43. 54. N.

ARAMPO, or MAN-EATER; a name given by the negroes on the African coaſt, to a long ſlender animal, ſhaped ſomewhat like a weaſel. It has a long tail buſhy at the end. It gets its name from digging up graves and feeding on human fleſh.

ARAN, a valley among the Pyrenean mountains, which is croſſed by the river Garonne, before it enters the Comines.

ARANDA-DE-DUERO, a town of Old Caſtile, ſeated on the Duero, 25 miles W. of Oſma, and 22 E. of Valladolid. Lon. 3. 30. W. Lat. 41. 40. N.

(I. 1.) ARANEA, in entomology, the SPIDER; a genus of inſects belonging to the order of aptera, or inſects without wings. All the ſpecies of ſpiders have eight legs, with three joints in each, and terminating in three crooked claws; eight eyes, two before, two behind, and the reſt on the ſides of the head. In the fore part of the head, at the mouth there is a pair of ſharp crooked claws or forceps: theſe ſtand horizontally; and, when not exerted for uſe, are concealed in two caſes contrived for their reception, in which they fold like a claſp-knife, and there lie between two rows of teeth. A little below the point of each claw, there is a ſmall hole, through which Leewenhoek ſuppoſes the ſpider emits a kind of poiſon. But Dr Mead, in his Eſſay on Poiſons, diſſents wholly from this opinion, having never been able, on repeated examination, to diſcover any ſuch opening, not even in the claws of the largeſt foreign ſpider; which being above fifty times bigger than any of the European ſpiders, would more eaſily have afforded a view of this opening, if nature had allotted any to this part of the animal. Beſides, repeated obſervations alſo convinced him that nothing dropped out of the claws, which were always dry while the ſpider bit any thing, but that a ſhort white proboſcis was at the ſame inſtant thruſt out of the mouth, which inſtilled a liquor into the wound. And the ſame author obſerves, that the quantity of liquor emitted by our common ſpiders when they kill their prey, is viſibly ſo great, and the wounding weapons ſo minute, that they could contain but a very inconſiderable portion thereof, if it were to be diſcharged that way. Theſe claws are the weapons with which they kill flies, &c. for their food. The belly or hinder part is ſeparated from the head and breaſt by a ſmall thread-like tube. The ſkin or outer ſurface is a hard poliſhed cruſt. Spiders frequently caſt their ſkins, which may be found in the webs perfectly dry and tranſparent; and from ſuch ſkins the forceps, or claws, for they are always ſhed with the ſkins, may eaſier be ſeparated, and examined with much greater exactneſs, than in the common ſpider while living. Spiders have 5 tubercles or nipples at the extremity

mity of the belly, whose apertures they can enlarge or contract at pleasure. It is through these apertures that they spin a gluey substance of which their bellies are full. They fix the end of their threads by applying these nipples to any substance, and the thread lengthens in proportion as the animal recedes from it. They can stop the issuing of the threads by contracting the nipples, and reascend by means of the claws of their feet, much in the same manner as some men warp up a rope. When the common house spider begins her web, she generally chooses a place where there is a cavity, such as the corner of a room, that she may have a free passage on each side, to make her escape in case of danger. Then she fixes one end of her thread to the wall, and passes on to the other side, dragging the thread along with her (or rather the thread follows her as she proceeds), till she arrives at the other side, and there fixes the other end of it. Thus she passes and repasses, till she has made as many parallel threads as she thinks necessary for her purpose. After this, she begins again and crosses these by other parallel threads, which may be named the *woof*. These are the toils or snares which she prepares for entangling flies, and other small insects, which happen to light upon it. She also generally weaves a small cell for herself, where she lies concealed watching for her prey. Betwixt this cell and the large web she has a bridge of threads, which, by communicating with the threads of the large one, both give her early intelligence when any thing touches the web, and enables her to pass quickly in order to lay hold of it. There are many other methods of weaving peculiar to different species of spiders, all intended for the same purpose.

(2.) ARANEA, DISCOVERIES RESPECTING THE. The darting out of long threads, which has been observed by the naturalists, and by means of which some species of spiders can convey themselves to great distances, deserves particular notice. Dr Lister tells us, that attending closely to a spider weaving a net, he observed it suddenly to desist in the mid work; and turning its tail to the wind, it darted out a thread with the violence and stream we see water spout out of a jet: this thread, taken up by the wind, was immediately carried to some fathoms long; still issuing out of the belly of the animal. By-and-by the spider leaped into the air, and the thread mounted her up swiftly. After this discovery, he made the like observation on near 30 different species of spiders; and found the air filled with young and old, sailing on their threads, and doubtless seizing gnats and other insects in their passage, there being often manifest signs of slaughter, legs and wings of flies, &c. on these threads, as well as in their webs below. Dr Hulse discovered the same thing about the same time. Dr Lister thinks there is a hint of the darting of spiders in Aristotle, *(Hist. An. lib.* ix. *cap.* 39.) and in Pliny, *(lib.* x. *cap.* 74.) But with regard to their sailing, the ancients are silent, and he thinks it was first seen by him. He also observes of those sailing spiders, that they will often dart, not a single thread only, but "a whole sheaf at once, consisting of many filaments; yet all of one length, all divided each from the other, and distinct until some chance either snap them off or enlarge them. But for the most part the longer they grow, the more they spread, and appear to a diligent observer like the numerous rays in the tail of a blazing star. As for that which carries them away in the air, so swift off-hand, it is partly their sudden leap; partly the length and number of the threads projected, the stream of the air and wind beating more forcibly upon them, and partly the posture and management of their feet, which, at least by some sort of them, I have observed to have been used very like wings or oars, the several legs (like our fingers) being sometimes close joined, at other times opened, again bent, extended, &c. according to the several necessities and will of the sailor. To fly they cannot be strictly said, they being carried into the air by external force; but they can, in case the wind suffer them, steer their course, and perhaps mount and descend at pleasure: and to the purpose of rowing themselves along the air, it is observable that they ever take their flight backwards; that is, their head looking a contrary way, like a sculler upon the Thames. It is scarce credible to what height they will mount; which yet is precisely true, and a thing easily to be observed by one that shall fix his eye some time on any part of the heavens, the white webs, at a vast distance, very distinctly appearing from the azure sky; but this is in autumn only, and that in very fair and calm weather." In a letter to Mr Ray, dated January 1670, speaking of the height spiders are able to fly to, he says "Last October, &c. I took notice, that the air was very full of webs; I forthwith mounted to the top of the highest steeple on the Minister (in York), and could there discern them yet exceeding high above me." He further observes, that they not only thus shoot their threads upward, and mount with it in a line almost perpendicular; they also project them in a line parallel to the horizon, as may be seen by their threads running from one wall to another in a house, or from one tree to another in the field, and even from wall to wall across gardens of considerable extent. The matter of which the spider's threads are formed, is a viscid juice, elaborated in the body of the animal, and emitted from papillæ situated at the extremity of the belly; which are furnished with numerous apertures that do the business of wire-drawers, as it were, in forming the threads. Of these apertures Mr Reaumur observes, there are enough in the compass of the smallest pin's head to yield a prodigious quantity of distinct threads. The holes are perceived by their effects: take a large garden spider ready to lay its eggs, and applying the finger on a part of its papillæ, as you withdraw that finger it will take with it an amazing number of different threads. M. Reaumur has often counted 70 or 80 with a microscope, but has perceived that there were infinitely more than he could tell. In effect, if he should say that each tip of a papillæ furnished a thousand, he is persuaded he would say far too little. The part is divided into an infinity of little prominences, like the eyes of a butterfly, &c. Each prominence no doubt makes its several threads; or rather between the several protuberances there are holes that give vent to threads; the use of the protuberances, in all probability,

bability, being to keep the threads at their firſt exit, before they are yet hardened by the air, aſunder. In ſome ſpiders thoſe protuberances are not ſo ſenſible; but in lieu thereof there are tufts of hair which may ſerve the ſame office, viz. to keep the threads apart. Be this as it will, there may threads come out at above a thouſand different places in every papilla; conſequently the ſpider, having five papillæ, has holes for above five thouſand threads. Such is the tenuity of the threads in the larger ſort of ſpiders. But if we examine the young produced by thoſe, we ſhall find that they no ſooner quit their egg than they begin to ſpin. Indeed their threads can ſcarce be perceived, but the webs may: they are frequently as thick and cloſe as thoſe of houſe ſpiders; and no wonder, there being often 400 or 500 little ſpiders concurring to the ſame work. How minute muſt their holes be? the imagination can ſcarce conceive that of their papillæ! The whole ſpider is perhaps leſs than a papilla of the parent which produced it. But there are even ſome kinds of ſpiders ſo ſmall at their birth, that they are not viſible without a microſcope. These are uſually found an infinity of theſe in a cluſter, and they only appear like a number of red points: And yet there are webs found under them, though well nigh imperceptible. What muſt be the tenuity of one of thoſe threads? Mr Leewenhoek has computed, that 100 of the ſingle threads of a full grown ſpider are not equal to the diameter of the hair of his beard; and conſequently, if the threads and hair be both round, ten thouſand ſuch threads are not bigger than ſuch a hair. He calculates farther, that when young ſpiders firſt begin to ſpin, 400 of them are not larger than one of a full growth; allowing which, 4,000,000 of a young ſpider's threads are not ſo big as the ſingle hair of a man's beard.

(3.) ARANEA, GENERATION, &c. OF THE. The act of generation among ſpiders varies in different ſpecies. As theſe inſects prey upon each other, except during the time of their amours, they dare not come within the reach of one another but with the utmoſt caution. They may ſometimes be ſeen ſtretching out their legs, ſhaking the web, and tampering with each other by a ſlight touch with the extremity of their feet; then, in a fright, dropping haſtily down their thread, and returning in a few moments to make freſh trial by feeling. —When once both parties are well aſſured of the ſex they have to deal with, the approaches of the feet, in order to feel, become more frequent, confidence takes place, and the inſtant of amorous dalliance enſues. "We cannot," ſays Lyonnet, "but admire how careful they are not to give themſelves up blindly to a paſſion, or venture on an imprudent ſtep which might become fatal to them." Liſter and Lyonnet, two accurate obſervers, ſay, that the extremity of thoſe arms, or claws, which the ſpider uſes to graſp his prey with, ſuddenly opens, as it were by a ſpring, and lets out a white body, which the male applies beneath the abdomen of the female. In the water ſpider, the ſexual organs are ſituated at the hinder parts of the male, are curve, and act as it were by a ſpring; thoſe of the females are diſtinct. Nature by a thouſand varied methods accompliſhes her purpoſe. Spiders frequently change their colour, which varies much in reſpect to ſeaſon, ſex, age, &c. but they are in general more beautifully variegated in autumn; a ſeaſon not only moſt opportune and plentiful reſpecting their prey, but the time when they arrive at their greateſt magnitude, and are in their height of vigour.

(4.) ARANEA, SILK OF THE. Garden ſpiders, particularly the ſhort legged ſpecies, yield a kind of ſilk, which has by ſome been judged ſcarce inferior to that of the ſilk-worm. Mr Bon of Languedoc, about 80 years ago, contrived to manufacture from it a pair of ſilk ſtockings and mittens, of a beautiful natural grey colour, which were almoſt as handſome and ſtrong as thoſe made with common ſilk; and he publiſhed a diſſertation concerning the diſcovery. But M. Reaumur, being appointed by the Royal Academy to make a farther inquiry into this new ſilk work, raiſed ſeveral difficulties and objections againſt it, which are found in the Memoirs of the Academy for the year 1710. The ſum of what he has urged amounts to this. The natural fierceneſs of the ſpider renders them unfit to be bred and kept together. Four or five thouſand being diſtributed into cells, 50 in ſome, 100 or 200 in others, the big ones ſoon killed and eat the leſs, ſo that in a ſhort time there were ſcarce left one or two in each cell; and to this inclination of mutually eating one another M. Reaumur aſcribes the ſcarcity of ſpiders, conſidering the vaſt number of eggs they lay. But this is not all: he even affirms, that the ſpider's bag is inferior to that of the ſilk worm both in luſtre and ſtrength, and that it produces leſs matter to be manufactured. The thread of the ſpider's web, he ſays, only bears a weight of two grains without breaking; and that of the bag bears 36. The latter, therefore, in all probability, is eighteen times thicker than the former; yet it is weaker than that of the ſilk worm, which bears a weight of two drams and a half.—So that 5 threads of the ſpider's bag muſt be put together to equal one thread of the ſilk-worm's bag. Now it is impoſſible theſe ſhould be applied ſo juſtly over one another as not to leave little vacant ſpaces between them, whence the light will be reflected; and of conſequence, a thread thus compounded muſt fall ſhort of the luſtre of a ſolid thread. Add to this, that the ſpider's thread cannot be wound off as that of the ſilk worm may, but muſt of neceſſity be carded; by which means being torn in pieces, its evenneſs, which contributes much to its luſtre, is deſtroyed. In effect, this want of luſtre was taken notice of by M. de la Hire, when the ſtockings were preſented to the academy. Again, ſpiders furniſh much leſs ſilk than the worms: the largeſt bags of theſe latter weigh 4 grains, the ſmaller 3 grains; ſo that 2304 worms produce a pound of ſilk. The ſpider bags do not weigh above 1 grain; yet when cleared of their duſt and filth, they loſe two thirds of their weight. The work of 12 ſpiders, therefore, only equals that of one ſilk-worm; and a pound of ſilk will require at leaſt 27,648 ſpiders. But as the bags are wholly the work of the females, who ſpin them to depoſit their eggs in, the number muſt be doubled. Yet will this only hold of the beſt ſpiders; thoſe large ones ordinarily ſeen in gardens, &c. ſcarce

yielding

yielding a twelfth part of the ſilk of the others: 280 of theſe, he ſhows, would not yield more than one ſilk worm; 663,552 of them would ſcarce yield a pound.

(5.) ARANEA, SPECIES OF THE. The ſpecies of aranea enumerated by naturaliſts amount upwards of 50; of which it may here ſuffice to mention a few of the moſt remarkable.

1. ARANEA AQUATICA, or the WATER SPIDER, is of a livid colour, with an oval belly, and a tranſverſe line, and two hollowed points. It frequents the freſh waters of Europe. But it is in ſome ſort amphibious: for it can live on land as well as in the water, and comes often on ſhore for its food; yet it ſwims well in water, both on its belly and back: it is diſtinguiſhed by its brightneſs. In the water its belly appears covered with a ſilver varniſh, which is only a bubble of air attached to the abdomen by means of oily humours which tranſpire from its body, and prevent the immediate contact of the water. This bubble of air is made the ſubſtance of its dwelling, which it conſtructs under water: for it fixes ſeveral threads of ſilk, or ſuch fine matter, to the ſtalks of plants in the water; and then aſcending to the ſurface, thruſts the hinder part of its body above water, drawing it back again with ſuch rapidity, that it attaches underneath a bubble of air, which it has the art of detaining under water, by placing it underneath the threads above mentioned, and which it binds like a covering almoſt all around the air bubble. Then it aſcends again for another air bubble; and thus proceeds until it has conſtructed a large aerial apartment under water, which it enters into or quits at pleaſure. The male conſtructs for himſelf one near the female; and when love invites, he breaks through the thread walls of the female's dwelling, and the two bubbles attached to the bellies of both unite into one, forming one large nuptial chamber. The female is ſometimes laid for a whole day together ſtretched on her back, waiting for the arrival of the male, without motion, and ſeemingly as if dead. As ſoon as he enters and glids over her ſhe ſeems to be brought to life again, gets on her legs, and runs after the male, who makes his eſcape with all poſſible ſpeed. The female takes care of the young, and conſtructs ſimilar apartments on purpoſe for them. The figure of this ſpider has nothing remarkable, and would be overlooked among a crowd of curioſities, if the ſpectator be unacquainted with its ſingular art of conſtructing an aerial habitation under water, and thus uniting together the properties of both elements. It lodges during the winter in empty ſhells, which it dextrouſly ſhuts up with a web.

2. ARANEA AVICULARIA has a convex round breaſt, hollowed tranſverſely in the middle. It is a native of America, and feeds upon ſmall birds, inſects, &c. The bite of this ſpider is as venomous as that of the ſerpent.

3. ARANEA CALYCINA, with a round pale yellow belly, and two hollow points. It lives in the cups of flowers, after the flower leaves have fallen off; and catches bees, and other flies, when they are in ſearch of honey.

4. ARANEA CUCURBITINA has a globular yellow belly, with a few black ſpots. It makes its abode among the leaves of trees, and incloſes its eggs in a ſoft net.

5. ARANEA DIADEMA is the largeſt ſpider which this country produces. The abdomen is of an oval form, downy, and of a ruddy yellow colour, which is very variable in different ſeaſons; being ſometimes pale, at others very dark coloured. The upper part is beautifully adorned with black and white circles and dots, having a longitudinal band in the middle, compoſed of oblong and oval ſhaped pearl coloured ſpots, ſo arranged as to reſemble a fillet, ſimilar to thoſe worn by the eaſtern kings. The ground upon which this fillet and the white dots are laid, when viewed with a glaſs, and the ſun ſhining thereon, is beautiful and rich beyond all deſcription. There are varieties in colour of this ſpider when young: ſome have their abdomen purple, ornamented with white dots, the legs yellow and annulated with a deeper colour: others have their abdomen of a fine red, likewiſe ornamented with white, but their legs of a fine pale green colour, annulated with dark purple or black. It inhabits the birch tree.

6. ARANEA FASCIATA, with yellow bands round the belly, and duſky rings on the legs, is a native of Barbary, and is as large as the thumb. It inhabits hedges and thickets: its webs have large meſhes, and it reſides in the centre. The ſnares are ſpread for large flies, waſps, drones, and even locuſts: the leſſer inſects can eſcape through the meſhes. The animal which it entangles is ſoon bound with ſtrong threads; killed by the ſpider's jaws; and partly eat, if the ſpider is hungry: the reſt is concealed under ſome neighbouring dry leaves, covered with a kind of web, and a blackiſh glue in great abundance. Its larder is ſaid to be often plentifully ſtored:—Its neſt is of the ſize of a pigeon's egg, divided horizontally, and ſuſpended by the threads of the inſect, which are of a ſilvery white, and ſtronger than ſilk. The young ones live in amity; but when grown up, are mortal enemies. They never meet but they fight with violence, and their battle only ends with the death of the weakeſt. The dead body is carefully ſtored in the larder. Twelve of theſe ſpiders, by way of experiment, were ſhut up together; and, after a battle of 8 days, the ſtrongeſt only remained alive.

7. ARANEA FIMBRIANA, has a black oblong belly, with a white line on each ſide, and duſky coloured legs. It lives in water, upon the ſurface of which it runs with great ſwiftneſs.

8. ARANEA HOLOSERICEA, has an ovaliſh belly covered with a down like velvet; at the baſe, or under part, it has two yellow ſpots. It is found in the folded leaves of plants.

9. ARANEA LABYRINTHICA, with a duſky oval belly, a whitiſh indented line, and a forked anus. The web of this ſpecies is horizontal, with a cylindrical well or tube in the middle.

10. ARANEA OCELLATA, has three pair of eyes on its thighs. It is about the ſame ſize with the tarantula, (See N° 12, § 1.) of a pale colour, with a black ring round the belly, and two large black ſpots on the ſides of the breaſt. It is a native of China.

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11. ARANEA SACCATA has an oval belly, of a dusky iron colour. It lives in the ground, and carries a ſack with its eggs, wherever it goes. This ſack it glues to its belly, and will rather die than leave it behind.

12. (1.) ARANEA TARANTULA has the breaſt and belly of an aſh colour; the legs are likewiſe aſh coloured, with blackiſh rings on the under part; the fangs or nippers are red on the inner ſide, the reſt being blackiſh: Two of its eyes are larger than the other, red, and placed in the front; four other eyes are placed in a tranſverſe direction towards the mouth; the other two are nearer the back: It has two antennæ or feelers. It is a native of Italy, Cyprus, Barbary, and the Eaſt Indies, It lives in bare fields, where the lands are fallow, but not very hard; and from its antipathy to damp and ſhade, chooſes for its reſidence the riſing part of the ground facing the eaſt. Its dwelling is about four inches deep, and half an inch wide; at the bottom it is curved, and there the inſect ſits in wet weather, and cuts its way out, if water gains upon it. It weaves a net at the mouth of the hole. Theſe ſpiders do not live quite a year. In July they ſhed their ſkin, and proceed to propagation; which, from a mutual diſtruſt, as they frequently devour one another, is a work undertaken with great circumſpection. (See § 3.) They lay about 730 eggs, which are hatched in the ſpring; but the parent does not live to ſee her progeny, as ſhe expires early in the winter. The Ichneumon fly is their moſt formidable enemy.

(2.) ARANEA TARANTULA, EFFECTS OF THE BITE OF THE. The bite of the tarantula is ſaid to occaſion an inflammation in the part, which in a few hours brings on ſickneſs, difficulty of breathing, and univerſal faintneſs. The perſon is afterwards affected with a delirium, and ſometimes is ſeized with a deep melancholy. The ſame ſymptoms return annually, in ſome caſes, for ſeveral years; and at laſt terminate in death. Muſic, it has been pretended, is the only cure. A muſician is brought, who tries a variety of airs, till at laſt he hits upon one that urges him to dance; the violence of which exerciſe produces a proportionable agitation of the vital ſpirits, attended with a conſequent degree of perſpiration, the certain conſequence of which is a cure. Such are the circumſtances that have been generally related, and long credited, concerning the bite of this animal. Kircherus, in his *Muſurgia*, gives a very particular account of the ſymptoms and cure, illuſtrated by hiſtories of caſes. Among theſe, he mentions a girl, who being bitten by this inſect, could be cured only by the muſic of a drum. He relates, that a certain Spaniard, truſting to the efficacy of muſic in the cure of the frenzy occaſioned by the bite of the tarantula, ſubmitted to be bitten on the hand by two of theſe creatures, of different colours, and poſſeſſed of different qualities. The venom was no ſooner diffuſed about his body, than the ſymptoms of the diſorder began to appear; upon which harpers, pipers, and other muſicians, were ſent for, who by various kinds of muſic endeavoured to rouſe him from that ſtupor into which he was fallen: but here it was obſerved that the bites of the two inſects had produced contrary effects; for by one he was incited to dance, and by the other he was reſtrained therefrom; and in this conflict of nature the patient expired. The ſame account is given in his *Phonurgia Nova*, with the addition of a cut repreſenting the inſect in two poſitions, the patient in the action of dancing, together with the muſical notes of the tune or air by which in one inſtance the cure was effected.

(3.) ARANEA TARANTULA, OPINIONS AS TO THE BITE OF THE Kircher, in his Muſurgia, attempting mechanically to account for the cure of the bite of the tarantula by muſic, ſays of the poiſon, That it is ſharp, gnawing, and bilious; and that it is received and incorporated into the medullary ſubſtance of the fibres. With reſpect to the muſic, he ſays, That the ſounds of chords have a power to rarefy the air to a certain harmonical pitch; and that the air thus rarefied, penetrating the pores of the patient's body, affects the muſcles, arteries, and minute fibres, and incites him to dance; which exerciſe begets a perſpiration, in which the poiſon evaporates. Unſatisfactory as this theory appears, the belief of this ſtrange phenomenon has prevailed among the ableſt of modern phyſicians. Sir Thomas Brown, ſo far from diſputing it, ſays, That ſince many atteſt the fact from experience, and that the learned Kircherus hath poſitively averred it, and ſet down the ſongs and tunes ſolemnly uſed for the diſeaſe, and ſince ſome alſo affirm that the tarantula itſelf will dance at the ſound of muſic, he ſhall not at all queſtion it. *Vulg. Err. B.* iii. *C.* 28. Farther, that eminent Italian phyſician of the laſt century, Baglivi, a native of Apulia, the country where the tarantula is produced, has written a diſſertation *De anatomia, morſu, et effectibus tarantulæ*. In this he deſcribes the region of Apulia where the tarantula is produced, with the anatomy and figure of the inſect and its eggs, illuſtrated by an engraving; he mentions particularly the ſymptoms that follow from the bite, and the cure of the diſeaſe by muſic, with a variety of hiſtories of cures thus wrought, many of them communicated by perſons who were eye witneſſes of the proceſs. Ludovicus Valetta, a Celeſtine monk of Apulia, publiſhed at Naples, in the year 1706, a treatiſe upon this ſpider, in which he not only anſwers the objections of thoſe who deny the whole, but gives, from his own knowledge, ſeveral inſtances of perſons who had ſuffered this way, ſome of which were of great families, and ſo far from being diſſemblers, that they would rather, to avoid ſhame, have concealed the misfortune. The honourable Robert Boyle, in his treatiſe of Languid and Unheeded Motions, ſpeaking of the bite of the tarantula, and the cure of the diſeaſe which follows it, by means of muſic, ſays "That, having himſelf had ſome doubts about the matter, he was, after ſtrict inquiry, convinced that the relations in the main were true." Dr Mead, in his Mechanical Account of Poiſons, has given an eſſay on the tarantula, containing the ſubſtance of the above relations, which he endeavours to confirm by his own reaſoning.

(4.) ARANEA TARANTULA, OPPOSITE OPINIONS RESPECTING THE. Notwithſtanding the number and weight of theſe authorities, and the general ac-

quiescence of learned and ingenious men in the opinion that the bite of the tarantula is poisonous, and that the cure of the disorder occasioned by it is effected by music, we have reason to apprehend that the whole is a mistake. In the Philosophical Transactions for 1672, p. 406. is an extract of a letter from Dr Thomas Cornelio, a Neapolitan physician, to John Doddington, Esq; his majesty's resident at Venice, communicated by the latter, in which, speaking of his intention to send to Mr Doddington some tarantulas, he says, "Mean while I shall not omit to impart to you what was related to me a few days since by a judicious and unprejudicate person; which is, that being in the country of Otranto, where those insects are in great numbers, there was a man who, thinking himself stung by a tarantula, showed in his neck a small speck, about which in a very short time there arose some pimples full of a serous humour; and that, in a few hours after, the poor man was sorely afflicted with very violent symptoms, as syncopes, very great agitations, giddiness of the head, and vomiting; but that, without any inclination at all to dance, and without a desire of having any musical instruments, he miserably died within two days. The same person affirmed to me, that all those that think themselves bitten by tarantulas, (except such as for evil ends feign themselves to be so,) are for the most part young wanton girls, whom the Italian writers call *Dolce di Sale;* who, by some particular indisposition, falling into this melancholy madness, persuade themselves, according to the vulgar prejudice, to have been stung by a tarantula." Dr Serao, an Italian physician, has written an engenious book, in which he has effectually exploded this opinion as a popular error: and in the Philosophical Transactions, N° LX. for the year 1770, p. 236, is a letter from Dominico Cirillo, M. D. professor of natural history, in the university of Naples, wherein, taking notice of Serao's book, he says, That having had an opportunity of examining the effects of this animal in the province of Taranto, where it is found in great abundance, he finds that the surprising cure of the bite of the tarantula by music has not the least truth in it; and that it is only an invention of the people, who want to get a little money by dancing when they say the tarantism begins. He adds, "I make no doubt but sometimes the heat of the climate contributes very much to warm their imaginations, and throw them into a delirium, which may in some measure be cured by music; but several experiments have been tried with the tarantula, and neither men nor animals after the bite have had any other complaint than a very trifling inflammation upon the part, like that produced by the bite of a scorpion, which goes off by itself without any danger at all. In Sicily, where the summer is still warmer than in any part of the kingdom of Naples, the tarantula is never dangerous; and music is never employed for the cure of the pretended tarantism." Mr Swinburn, when in the country of the tarantula, was desirous of investigating minutely every particular relative to that insect; but the season was not far enough advanced, and no *tarentati* (persons bitten or pretending to be bitten, by the tarantula) had begun to stir. He prevailed, however, upon a woman who had formerly been bitten, to act the part, and dance the tarantata before him. A great many musicians were summoned, and she performed the dance, as all persons assured him, to perfection. At first she lolled rapidly on a chair, while the instruments were playing some dull music. They touched, at length, the chord supposed to vibrate to her heart; and she sprung up with a most hideous yell, staggered about the room like a drunken person, holding a handkerchief in both hands, raising them alternately, and moving in very true time. As the music grew brisker, her motions quickened, and she skipped about with great vigour and variety of steps, every now and then shrieking very loud. The scene was far from pleasant; and, at last, the fire, an end was put to it before the woman was tired. Wherever the tarantati are to dance, he informs us, a place is prepared for them, hung round with bunches of grapes and ribbons. The patients are dressed in white, with red, green, and yellow ribbons, for those are their favourite colours; on their shoulders they cast a white veil, let their hair fall loose about their ears, and throw their heads as far back as they can bear it. They are exact copies of the ancient priestesses of Bacchus. The orgies of that god, whose worship under various symbols, was more widely spread over the globe than that of any other divinity, were no doubt performed with energy and enthusiasm by the lively inhabitants of this warm climate. The introduction of Christianity abolished all public exhibitions of these heathenish rites, and the women durst no longer act a frantic part in the character of Bacchantes. Unwilling to give up so darling an amusement, they devised other pretences; and possession by evil spirits may have furnished them with one. Accident may also have led them to a discovery of the tarantula; and, upon the strength of its poison, the Puglian dancers still enjoy their old dance, though time has effaced the memory of its ancient name and institution: and this Mr Swinburn takes to be the origin of so strange a practice. If at any time these dancers are really and involuntarily affected, he supposes it can be nothing more than an attack upon their nerves, a species of St Vitus's dance; and he inclines the more to the idea, as there are numberless churches and places throughout these provinces dedicated to that saint. Many sensible people of the country, however, differ in opinion from Dr Serao and other authors who have ridiculed the pretended disorder, and affirmed that the venom of this species of spider can produce no effects but such as are common to all others. The Brindisians say, that the tarantulas sent to Naples for the experiment were not of the true sort, but a much larger and more innocent one; and that the length of the journey, and want of food, had weakened their power so much as to suffer the doctor or others to put their arm into the bag where they were kept with impunity. They quote many examples of persons bitten as they slept out in the fields during the hot months, who grew languid, stupid, deprived of all courage and elasticity, till the sound of some favourite tune roused them to dance, and threw off the poison. These arguments, however, Mr Swinburn

burn thinks of little weight: for they acknowledged that elderly perſons were more frequently infected than young ones; and that moſt of them were women, and thoſe unmarried. No perſon above the loweſt rank in life was ever ſeized with this malady, nor is there an inſtance of its cauſing death. The length of the dance, and the patient's powers of bearing ſuch exceſſive fatigue in the caſe of fear ſon, prove nothing; becauſe every day, at that time of the year, peaſants may be ſeen dancing with equal ſpirit and perſeverance, though they do not pretend to be ſeized with the tarantiſm. The illneſs may therefore be attributed to hyſterics, exceſſive heat, ſtoppage of perſpiration, and other effects of ſleeping out of doors in a hot ſummer air, which is always extremely dangerous, if not mortal, in moſt parts of Italy. Violent exerciſe may have been found to be a certain cure for this diſorder, and continued by tradition, though the date and circumſtances of this diſcovery have been long buried in oblivion; a natural paſſion for dancing, imitation, cuſtom of the country, and a deſire of raiſing contributions upon the ſpectators, are probably the real motives that inſpire the tarantati. Before Serao's experiments, the tarantula had been proved to be harmleſs, from trials made in 1693 by Clarrizio, and in 1740 at Lucera by other naturaliſts.

13. ARANEA VIATICA, or wanderer, is generally of a yellow colour, more or leſs deep. Sometimes it is whitiſh, and even rather green. The abdomen is large, broad, almoſt ſquare, with two bands of dark orange, which ariſing from the thorax, deſcend obliquely on the ſides towards the middle. Between the bands are a few ſmall black dots, forming a kind of triangle upon the middle of the abdomen. On the thorax are ſeen two longitudinal bands, ſomewhat green, one on each ſide. The two foremoſt pair of legs are very long, and the hinder ſhort; which makes it walk like a crab. It is found upon plants; and is a lively, active, indefatigable hunter. Without any motion of the head, which is furniſhed with immoveable eyes, it perceives all the flies that hover round about, does not ſcare them, but ſtretches over them its arms, furniſhed with feathers, which prove nets in which their wings intangle. It is ſaid to ſit on its eggs; which, however, it often carries about with it, wrapt up in a ball of white ſilk.

(II.) ARANEA, in mineralogy, a ſilver ore found only in the mines of Potoſi, or in the ſingle mine there of Catamito. It owes its name to ſome reſemblance it bears to a cobweb, being compoſed of threads of pure ſilver, which appear like a ſilver lace, when burned to ſeparate the ſilk from it. It is the richeſt of all kinds of ſilver ore.

(II.) ARANEA CONCHA, in natural hiſtory, the name of a kind of ſea-ſhell, of which there are ſeveral ſpecies: we call them in Engliſh the ſpider ſhells: they are of the family of the murex, and their peculiar character is the having digitated lips. The ſeveral ſpecies have different numbers of fingers, from the lip of the ſhell, as four, five, ſix, ſeven, or eight.

(IV.) ARANEA TUNICA. See ARACHNOIDES, N° 1.

* ARANEOUS. *adj.* [from *aranea*, Lat. a cobwed.] Reſembling a cobweb.—The curious *araneous* membrane of the eye conſtringeth and dilateth it, and ſo varieth its focus. *Derham.*

ARANEUS, in medicine, a low pulſe, according to Galen. The word is uſed by Hippocrates for a flaky urine, having films like cobwebs in it.

ARANEUS MARINUS, the SEA SPIDER, a name by which ſome have called the fiſh more uſually known by the name of *draco marinus*, and ſuppoſed to have ſomething venomous in the ſpines of its back fin.

ARANIAS, a river in Tranſylvania.

ARANJUEZ, a town in the province of New Caſtile, where the king of Spain has a palace and gardens, which are reckoned the moſt delightful in the world. This palace is 20 miles S. of Madrid, by a pleaſant road, planted on each ſide with trees which coſt L. 120,000 Sterling. It is delightfully ſituated at the conflux of the rivers Tagus and Jarama; which run through the gardens, and add new beauty to this charming ſpot, where art and nature ſeem to go hand in hand with the moſt pleaſing and rural ſimplicity. On one ſide, fine avenues of ſtately oaks and lofty elms convey the trueſt ideas of magnificence, while they afford the moſt reviving ſhade; on the other, the ſudden tranſitions to lawns and wilderneſſes, the caſcades of water breaking through the thickets, the tuneful ſongs of numberleſs birds, ſheltered in theſe cool receſſes, the occaſional appearance and paſſage of the monarch, attended by the grandees of his kingdom; all theſe objects united, and concentered in one point, impreſs the mind of a traveller, with a thouſand agreeable ſenſations. The general ſituation is in a very large plain, ſurrounded with large hills, of a moſt diſagreeable aſpect, but ſeldom appearing, being well hidden by the rows of trees, that extend acroſs the flat in every direction. The main body of the palace is an old building, to which have been lately added, two new wings. The firſt part of the building was erected by Philip II. who purchaſed the eſtate, planted many of the avenues, and, in order to extend his chace, or to indulge his ſplenetic diſpoſition, had all the vines that grew on the hills rooted up. By that means he drove away the inhabitants, and rendered the environs of his villa a perfect deſart. The apartments are good; but contain nothing very particular, to take off from the enjoyment of ſo many fine objects abroad. In one of the new wings is a play houſe, and in the other a chapel. Part of the ceiling of the former was painted by Menga, who was alſo ſent to Rome to paint a holy family for the principal altar in the chapel. There are ſeven fine pictures of Luca Jordano, in the apartment called El Cabinete Antiguo, and ſix others in that De los Mayordomos. The portraits of the grand duke and ducheſs of Tuſcany, by Menga, are in the king's dreſſing room. In the chapel over the great altar, there is a fine picture of the Annunciation, by Titian, preſented to him by Charles V. and brought from the convent of Juſte, after the death of that emperor. The porcelain cabinet, where there are ſeveral large pieces of the king's own manufactory, is al-

ſo an object of curioſity to a traveller. The gardens conſiſt of 3 grand diviſions, diſtinguiſhed by the names of La Huerta Valenciana, Los Deleites, and El Cortijo. In the Huerta Valenciana, agriculture and gardening are carried on in the ſame manner as in that fruitful province, and they plough with horſes. In the Cortijo they uſe oxen, as in Andaluſia; and in other places, they ſcratch up the ground with mules, as is ſtill practiſed in ſome parts of Spain. Which ever way one looks round, a conſtant variety pleaſes the eye. In one place, the ſturdy buffalo draws his heavy burden; in another, the ſlow camel, with his ponderous load: in a third, the ſwift zebra with his ſtriped garment friſks over the plains. In the farm, every object of convenience is conſulted, and in the dairy, every degree of neatneſs. The Dutch Cow enjoys a luxuriant paſture, the brood mares greatly enliven the landſcape, and the ſtables are filled with moſt excellent horſes. And an immenſe nurſery furniſhes all manner of trees and plants. The fine avenue, which ſerves for a public walk, called Calle de Reyna, has nothing equal to it at Verſailles. It is 4 miles long, quite ſtraight from the palace gate, croſſing the Tagus twice, before it loſes itſelf in the thickets, where ſome ſpreading elms and tall poplars hang beautifully over the deep ſtill pool. Near this road is a flower garden for the ſpring, laid out with great taſte by Mr Wall, during his miniſtry. The gay variety of flowers is particularly pleaſing to the eye at this ſeaſon. As the weather grows hot, company, that chooſe to walk, retire to a garden in an iſland of the Tagus, on the north ſide of the palace. This is an elegant place, cut into various walks and circular lawns, which in their primitive ſtate, my have been very ſtiff and formal: but in the courſe of a century, nature has obliterated the regular forms of art: the trees have ſwelled out beyond the line traced for them, and deſtroyed the enfilade, by advancing into the walks, or retiring from them. The ſweet flowering ſhrubs, inſtead of being clipped and kept down, have been allowed to ſhoot up into trees, and hang over the ſtatues and fountains they were originally meant to ſerve as humble fences to.—The jets-d'eau daſh up among the trees, and add freſh verdure to the leaves. The terraces and baluſtrades built along the river, are now overgrown with roſes and other luxuriant buſhes, hanging down into the ſtream, which is darkened by the large trees growing on the oppoſite banks. Many of the ſtatues, groupes, and fountains, are handſome, ſome maſterly, the works of Algardi: all are placed in charming points of view, either in open circular ſpots, at a diſtance from the trees, or elſe in gloomy arbours, and retired angles of the wood. The banks of this wood, called the Illa, are alſo enlivened by elegant yachts for the amuſement of the royal family. The village formerly conſiſted of the palace, its offices, and a few miſerable huts, where the ambaſſadors, and the attendants of the court, endeavoured to lodge themſelves as well as they could, but always very uncomfortably; many of the habitations were vaults half under ground. What determined the king to build a new town and to embelliſh the environs, was an accident which happened at the nuncio's, a coach broke through the cieling of his dining room, and fell in upon the table. The court then began to apply very conſiderable ſums to the purpoſe of erecting proper dwellings for the great number of perſons that flock to the place where the ſovereign reſides; near 10,000 are ſuppoſed to live here two or three months in ſpring; the king keeps 115 ſets of mules, which require a vaſt number of men to take care of them. Above a million Sterling has been laid out at Atanjuez ſince 1763; and it muſt be acknowledged, that wonders have been performed: ſeveral fine ſtreets drawn in ſtraight lines with broad pavements, a double row of trees before the houſes, and a very grand road in the middle; commodious hotels for the miniſters and ambaſſadors; great ſquares, markets, churches, and a theatre, have been raiſed from the ground; beſides the acceſſion of two new wings to the palace, and an amphitheatre for that relict of Gothic barbarity, *bull baiting*. Neatneſs and convenience have been more ſtudied than ſhow in the architecture, but altogether, the place has ſomething truly magnificent in the coup d'œil.

ARANYAS-SZEK, ARANYOS-MAKOTH, ARANYOS-MEDGYES, and ARANY-VAR, } Four ſmall towns, or villages, in the kingdom of Hungary.

ARAPABACA, a name given by Plumier to the SPIGELIA of Linnæus, or worm graſs.

ARAR, or ARARIS, in ancient geography, a river of Celtic Gaul, which riſes out of mount Vogeſus, on the confines of Lorrain, runs thro' the Franche Comte and Burgundy, and falls into the Rhone below Lyons. It is ſo incredibly ſlow, that the eye cannot diſtinguiſh which way it moves, (Cæſar); and therefore Pliny calls it the Sluggiſh River. Ammianus calls it SAUCONA, which has ſince been changed to SAONE. It runs from N. to S. It is famous for a bridge of Cæſar, which was built by the ſoldiers in one day. It is navigable equally with the Rhone.

(1.) ARARAT, in ancient geography, the mountain on which Noah's ark reſted, after the abatement of the waters of the univerſal deluge. Concerning this mountain there are various conjectures; though it is almoſt univerſally allowed to be in Armenia Major. Some are of opinion that it is one of the mountains which divide Armenia on the ſouth from Meſopotamia and that part of Aſſyria inhabited by the *Curdi*; from whom theſe mountains took the name of *Curdæi* or *Cardæi*, by the Greeks turned into *Cordyæi*, &c. Others, that it lies towards the middle of Armenia, near the river Araxes, above 280 miles diſtant from the above mentioned mountains, making it belong to mount Taurus; but the Armenians are poſitive that Noah's Ararat is no other than a mountain to which they now give the name of *Maſis*, which lies about 12 leagues to the eaſt of Erivon, and 4 leagues from the Aras. It is encompaſſed by ſeveral petty hills; on the tops of them are found many ruins, thought to have been the buildings of the firſt men, who were, for ſome time, afraid to deſcend into the plains. It ſtands by itſelf, in form of a ſugar-loaf, in the middle of a very large plain, detached, as it were, from the other mountains of Armenia, which make a long

chain

chain. It conſiſts, properly ſpeaking, of two hills; the leſſer of which is the more ſharp and pointed: the higher, on which it is ſaid the ark reſted, lies NW. of it, and riſes far above the neighbouring mountains. It ſeems ſo high and big, that, when the air is clear, it may be ſeen four or five days journey off; yet travellers think the height is not extraordinary. Chardin is of opinion that he paſſed a part of mount Caucaſus which is higher; Poullet thinks the height of Mount Maſis, or Ararat, not above twice as great as that of mount Valerian, near Paris. They therefore think that its being viſible at ſuch a great diſtance is owing to its lonely ſituation in a vaſt plain, and upon the moſt elevated part of the country, without any mountains before it to obſtruct the view. Nor is the ſnow with which it is always covered from the middle upwards, any argument of its height; for, in this country, ice hath been often obſerved in the mornings of the middle of July. (See ARMENIA.) Certain it is, however, that this mountain hath never yet been aſcended; which the Armenians pretend was owing to the interpoſition of angels, in order to diſappoint the curioſity of thoſe who wanted to advance to ſuch a ſacred place as that whereon the ark reſted: but the exceſs of cold may very reaſonably be ſuppoſed able to fruſtrate all ſuch attempts, without any ſupernatural interpoſition. The moſt diſtinct account we have of this mountain is that given by Mr Tournefort; who tells us, that this mountain is one of the moſt diſagreeable ſights upon earth, without either houſes, convents, trees, or ſhrubs; and ſeems as if continually waſting and mouldering away. He divides it into three regions: The lowermoſt, he ſays, is the only one which contains any human creatures, and is occupied by a few miſerable ſhepherds that tend ſcabby flocks; and here are alſo found ſome partridges: the ſecond is inhabited by crows and tigers; and all the reſt is covered with ſnow, which half the year is involved in thick clouds. On the ſide of the mountain that looks towards Erivan is a prodigious precipice, from whence rocks of an immenſe ſize are frequently tumbling down with a hideous noiſe. This precipice ſeems quite perpendicular; and the extremities are rough and blackiſh, as if ſmutted with ſmoke. The ſoil of the mountain is looſe, and on the ſandy parts it is impoſſible to take a firm ſtep; ſo that our traveller encountered great difficulties in his aſcent and deſcent of this mountain; being often obliged, in order to avoid the ſand, to betake himſelf to places where great rocks were heaped on one another, under which he paſſed through caverns, or to places full of ſtones, where he was forced to leap from one ſtone to another. If we may believe Struys, a Dutch writer, however, all theſe difficulties may be ſurmounted. He aſſures us, he went five days journey up mount Ararat, to ſee a Romiſh hermit: that he paſſed through three regions of clouds; the firſt dark and thick, the next cold and full of ſnow, and the third colder ſtill: that he advanced five miles every day: and when he came to the place where the hermit had his cell, he breathed a very ſerene and temperate air: that the hermit told him, he had perceived neither wind nor rain all the 35 years he had dwelt there! and that on the top of the mountain there ſtill reigned a greater tranquillity, whereby the ark was preſerved uncorrupted. He farther pretends, that the hermit gave him a croſs made out of the wood of the ark, together with a certificate: a formal copy of which the author has given in his ſham relation.

(2.) ARARAT, the ancient name of Armenia. See ARMENIA.

ARARAUNA, in ornithology, the name of a Braſilian bird, of the macaw kind.

ARARI, a river in Braſil.

ARAS. See ARAXES.

ARASSI, a maritime, populous, and trading town of Italy, in the territory of Genoa; 5 miles SW. of Albinguay, and 37 E. of Ventimiglia. Lon. 7. 20. E. Lat. 44. 3. N.

ARASTH, a maritime town of Fez, ſeated on the Lucar, where it falls into the Atlantic.

ARATEIA, in antiquity, a yearly feſtival celebrated at Sicyon, on the birth-day of Aratus, wherein divers honours were paid by a prieſt conſecrated to this ſervice, who for diſtinction's ſake wore a ribband beſpangled with white and purple ſpots. It was ſolemnized with much pomp of muſick, the choriſters of Bacchus attending.

ARATHAPESCOW INDIANS, a nation in N. America, who carry on conſtant wars, with the Weſtern Dog-ribbed Indians.

* ARATION. *n. ſ.* [*aratio*, Lat.] The act or practice of plowing.

ARATO-BAFABEN, a fixed ſtar of the ſecond magnitude in the head of the dragon.

ARATORIA. See ARALIA, N° I.

* ARATORY. *adj.* [from *aro*, Lat. to plow.] That which contributes to tillage. *Dict.*

ARATUM TERRÆ, in our ancient law books, as much land as can be yearly tilled with one plough.—*Hoc manerium eſt* 30 *aratorum.*

ARATURAR TERRÆ, ancient ſervice which the tenant was to do his lord, by ploughing his land.

ARATURIA. See ARALIA, N° I.

(1.) ARATUS, a celebrated Greek poet, born at Soli, in Cilicia. He flouriſhed about the 124th, or 126th Olympiad, in the reign of Ptolemy Philadelphus king of Egypt. He diſcovered in his youth a remarkable poignancy of wit, and capacity for improvement; and having received his education under Dionyſius Heracleotes, a Stoic philoſopher, he eſpouſed the principles of that ſect. Aratus was phyſician to Antigonus Gonatas, king of Macedon; who being a great encourager of learned men, ſent for him to court, admitted him to his intimacy, and encouraged him in his ſtudies. The *Phænomena* of Aratus, which is ſtill extant gives him a title to the character of an aſtronomer as well as a poet. In this piece he deſcribes the nature and motion of the ſtars, and ſhows the particular influences of the celeſtial bodies. He wrote this poem in Greek verſe: it was tranſlated into Latin by Cicero; who tells us, in his firſt book *De oratore*, that the verſes of Aratus are very noble. There is alſo a tranſlation of this poem by Germanicus Cæſar, and another into elegant verſe by Feſtus Avienus. A quarto edition of the *Phænomena* was publiſhed by Grotius, at Leyden, in 1600, in Greek and Latin, with the fragments of

Cicero's

Cicero's version, and the translations of Germanicus and Avienus; all which the editor has illustrated with curious notes. He was certainly much esteemed by the ancients, since we find so great a number of commentators upon him. There are several other works also ascribed to Aratus. Suidas mentions the following: Hymns to Pan; Astrology and Astrothesy; a composition of Antidotes; an Ἐπιθάλαμον on Theopropus; an Ἐπιτάφιον on Antigonus; an Epigram on Phila, the daughter of Antipater, and wife of Antigonus; an Epicedium of Cleombrotus; a Correction of the Odyssey; and some Epistles, in prose. Virgil in his Georgics, has imitated or translated many passages from this author; and St Paul quoted a passage from Aratus, in his speech to the Athenians, Acts xvii. 28. wherein he told them, that some of their own poets have said, Τοῦ γὰρ καὶ γένος ἐσμέν; "For we are also his offspring." These words are the beginning of the fifth line of Aratus's Phænomena.

(2.) ARATUS, a famous general of the Achæans, who at 20 years of age, commenced the great attempt to deliver Greece from its tyrants, and establish one general republic among the different states. He began by expelling Nicocles the tyrant of his native country, Sicyon; which he thereby joined to the Achæan League, A. A. C. 253. Two years afterwards he took the fort Acrocorinthus, and delivered Corinth from the Macedonian yoke. Being afterwards repeatedly elected Prætor, or general of the league, he delivered Argos, and several other Grecian states from their tyrants. But in the midst of this successful career, while the League was flourishing throughout all Peloponnesus, it was deserted by the Lacedæmonians, whose king Cleomenes III. joined the Ætolians and defeated Aratus; A. A. C. 235. By the advice of Aratus, the Achæans called in the assistance of Antigonus II. king of Macedonia, who joined the League and defeated Cleomenes: but Aratus was afterwards poisoned by his ungrateful successor, Philip VI. whom he had newly restored, in the 2d year of the 141st Olympiad, and 62d of his age. He was interred at Sicyon, and received the greatest honours from his countrymen. See ARATEIA. Polybius gives us so great a character of Aratus's Commentaries or History, that the loss of so valuable a work is highly to be regretted.

(3.) ARATUS, the son of ARATUS, (N° 2.) was also Prætor of the Achæan League, and likewise poisoned by the ungrateful tyrant of Macedonia.

ARAVA, the name of, 1. a district; 2. a fortress; and 3. a river in Upper Hungary. The fort is seated 72 miles NW. of Cassovia. Lon. 20. 0. E. Lat. 49. 20. N.

ARAUCO, the name of, 1. a fortress; 2. a river; 3. a valley; and, 4. a town in Chili. The brave natives carried on a defensive war against the Spaniards for about a century, and at last drove them entirely out of it, though destitute of fire arms. They concluded a peace with them in 1650, and still maintain their independence. Lon. 73. 20. W. Lat. 37. 30. S. according to Walker; but others place it in 51. 20. W. Lon. and 42. 20. S. Lat. and others in 78. 6. W. Lon. and 37. 5. S. Lat.

ARAUNAH, or ORNAN, the Jebusite, a public-spirited husbandman, under David king of Israel; who generously offered the king a free gift of his threshing floor, wheat, oxen, and all, when he heard of David's intention of purchasing them, to build an altar, and sacrifice unto the Lord, that the calamity then raging in consequence of the royal folly might cease. The king however, refused his offer in these remarkable words, "Nay, but I will verily buy it for the full price, for I will not take that which is thine for the Lord, nor offer burnt offerings without cost." He accordingly paid Ornan 600 shekels of gold for the field, and 50 shekels of silver for the threshing floor, cattle, &c. See 2 Sam. xxiv. and 1 Chron. xxi. Araunah's field was afterwards the site of the temple; and Dr Ash says Araunah signifies the Ark.

ARAUSIO, CIVITAS ARAUSIENSIS, or ARAUSICORUM, in ancient geography, the capital of the Cavares, in Gallia Narbonensis. It is called *Colonia Secundanorum*, by Pliny and Mela, because the veterans of the 2d Legion were settled in it. It was then a very important place. It had a triumphal arch, erected by Marius and Catulus upon their victory over the Cimbri and Teutones. This arch was much damaged in 1707 and 1708. It has still the Remains of a fine amphitheatre and some aqueducts. It is now called ORANGE, and is seated on an arm of the Egue, at the foot of a mountain in the department of Drome, 36 miles N. of Avignon, and 50 NW. of Montpelier. Lon. 4. 49. E. Lat. 44. 9. N. See ORANGE.

ARAW, or AARAW, a large town and bailiwick of Bern in Switzerland, seated on the Aar, in Argow, 8 miles NE. of ARBURG, and 27 W. of Zurick. In this town the Diets of the Protestant Swiss Cantons are held. In these assemblies the deputies and their servants, being all citizens, dine together in the same hall. The town-house was built out of the ruins of the old castle, which the inhabitants of Aaraw totally demolished, when the Swiss shook off the yoke of Austria. Aaraw has an elegant church, a fine fountain and a fortress. Lon. 9. 10. (or according to others 18. 0.) E. Lat. 47. 20. N.

ARAXES, now ARAS, a river of Armenia Major, which takes its rise in a mountain called *Abos*, where the Euphrates also hath its origin. From this mountain it runs SE. across Armenia and part of Persia, in a serpentine course, discharging itself into the Caspian Sea, after a run of upwards of 500 miles, during which it receives some considerable rivers. Walker describes it as falling into the Kur, or Cyrus, before it arrives at the ocean. Some have imagined that it hath its rise in mount Ararat; but Tournefort assures us that it comes no nearer that mountain than 15 miles. The Araxes is a very rapid river, and is supposed to be the GIHON mentioned by Moses. Besides this extreme rapidity, it is very apt to overflow after rains; so that the endeavours to build bridges over it have proved abortive; though some of them appear, from the few arches remaining, to have been built of the best materials, and in the strongest manner. Such is the vehemence of its current after the thawing of the adjacent snows, or some fierce rains, that neither banks nor dykes can resist it. Nothing can exceed the noise and violence of its waves at such times: but in winter, when its waters are low, it is fordable in some places on camels.

To

To ARAY, *v. a.* to prepare. *Chaucer.*

ARAYA, a cape of S. America, which forms the N. point of the Oronoque. It contains ſalt pits, from which the Dutch uſed to ſupply themſelves freely till 1605, when their ſhips were deſtroyed by the Spaniards, who, in 1622, built a fort upon it.

(1.) ARBA, a city of the Anakims, afterwards called Hebron.

(2.) ARBA. See AMBRACIA.

(3.) ARBA. See ARBE. N° II.

(4.) ARBA, the father of Anak.

ARBACES, a governor of Media under Sardanapalus. Seeing him ſpinning among a company of his women, he ſtirred up his people to revolt, and dethroned Sardanapalus; who thereupon burnt himſelf in his palace. Arbaces being crowned, began the monarchy of the Medes, which laſted 317 years under nine kings, till Aſtyages was expelled by Cyrus. Arbaces reigned 22 years, and died A. M. 3206. See MEDIA.

ARBAGO, a place in Weſtmoreland, which produces a great quantity of iron ore.

ARBALEST, } See next article; alſo BALISTA,
ARBALET, } and CROSS BOW.

* ARBALIST. *n. ſ.* [from *arcus*, a bow, and *baliſta*, an engine to throw ſtones.] A croſs-bow. —It is reported by William Brito, that the arcubaliſta, or *arbaliſt*, was firſt ſhewed to the French by our king Richard the firſt, who was ſhortly after ſlain by a quarrel thereof. *Camden.*

(1.) ARBE, an ancient city, the capital of the iſland, (See N° II.) ſituated on a riſing ground between two harbours, which form a peninſula; and containing about 1000 inhabitants, among whom are many noble, but few rich families.

(II. 1.) ARBE, or ARBA, in ancient geography, an iſland of Illyria, in the gulph of Quarnaro. Of this iſland, which has been but ſlightly noticed by geographers, we have the following deſcription by the Abbe Fortis.

(2.) ARBE, CLIMATE, COAST, &c. OF. The climate of Arbe is none of the happieſt; the winter ſeaſon is horrid, eſpecially when agitated by the violent northerly winds, which ſometimes tranſform the intermediate ſeaſons into winter, and cauſe the ſummer itſelf to diſappear. Theſe furious winds do great damage to the iſland, particularly in the winter and ſpring. Two years ago, about 12,000 ſheep periſhed in one night, by cold, in the common paſtures of the mountain; where, according to the cuſtom over all Dalmatia, they are left in the open air the whole year round. The ſalt fog raiſed by the dreadful commotion of the waves, which often roars between the mountains of Arbe and the oppoſite Alps, in the narrow channel of Morlacca, conſumes all the buds of the plants and corn, if it happens to be driven upon the iſland by the wind; and it is followed by a ſcarcity of every kind of product. This calamity communicates its baneful influence even to the fleſh of the animals left on the paſtures, that becomes ill-taſted, in conſequence of the bitterneſs and bad nouriſhment of the food. Abſtracting from theſe irregularities, the air of Arbe is healthful; nor ought the conſtant ſummer fevers among the inhabitants to be attributed to its influence, as they are, more probably, derived from unwholeſome food, and a way of life differing little from the Hottentots. The appearance of the iſland is exceedingly pleaſant. On the eaſt it has a very high mountain, of the ſame ſubſtance as the Morlacca, of which it was once a part. At the foot of this mountain, the reſt of the iſland is extended to the weſtward, and divided into beautiful and fruitful plains interſperſed with little hills, fit to bear the richeſt products. At the extremity that looks to the north, a delightful promontory, called Loparo, ſtretches into the ſea; it is crowned with little hills, which almoſt quite incloſe a fine cultivated plain. Near this promontory are the two ſmall iſlands of S. Gregorio and Goli, very uſeful to ſhepherds and fiſhers. The coaſt of Arbe, that faces the Morlacca mountains, is quite ſteep and inacceſſible; and the channel between them is extremely dangerous, being expoſed to furious winds, and without a ſingle port on either ſide. The long and narrow iſland of Dolin, lying parallel to the iſland of Arbe, along the coaſt of Barbado, forms a channel leſs dangerous, though by no means ſo ſecure as it is beautiful to look at. There are ſeveral harbours in the neighbourhood of the city of Arbe, by which the trade of the beſt part of the iſland is facilitated.

(3.) ARBE, CURIOSITIES OF. Among the moſt remarkable curioſities of the iſland, the Arbegiani are proud of many religious reliques, and particularly of the head of S. Criſtofano their protector; but the lovers of ſacred antiquity will find ſomething much more ſingular in the three heads of Shadrach, Meſhech, and Abednego, which are venerated there with great devotion. Four of the principal gentlemen are keepers of the ſanctuary, and to their care the precious records of the city are alſo committed. Among theſe records is a tranſaction of MXVIII, by which the city of Arbe promiſes to the Doge of Venice, Ottone Orſeolo, a tribute of ſome pounds *de ſeta ſerica*, "of wrought ſilk," and in caſe of contravention, pounds *de auro obrizo*, "of pure gold." In the laſt age there was a learned biſhop of Arbe, named Ottavio Spaderi, who would not permit the reliques of S. Criſtofano to be expoſed to the public veneration, on the ſolemnity of the ſaint's day, becauſe he doubted of their authenticity. The mob roſe and was going to throw him down from the top of the hill on which the cathedral ſtands; nor did the tumult ceaſe after the day was paſt. The government ſent an armed veſſel to deliver the prelate from the danger he was in; and the Pope thought proper to give him a more tractable *ſpouſe* in Italy.

(4.) ARBE, HISTORY OF. In the times of the Romans, it is probable that there were no other cities in Arbe but that which bears the name of the iſland, in the neighbourhood of which ancient monuments are frequently dug up. Though this ſmall iſland is not above 20 miles round, wholly uncultivated, and uninhabitable in the higheſt part that faces the channel of Morlacca, it has always maintained itſelf with decorum. That it was inhabited by civilized people in the time of the Romans is evident, by the inſcriptions frequently diſcovered, and others that ſtill remain at Arbe. In the lower times it partook of all the calamities to which all the neighbouring countries were ſubjected,

ted, but always recovered itself even after diſſolution. The archives of the community of Arbe contain ſome ancient papers that are truly valuable, and they are kept with great jealouſy; by them it appears, that, in the 11th century, gold and ſilk were not rare among the inhabitants. Arbe was ſubject to the kings of Hungary; afterwards it became dependent on Venetian feudatories; and at laſt was taken under the immediate dominion of that republic, by which a governor is appointed with the title of count and captain.

(5.) ARBE, POPULATION OF. The number of people on the iſland does not much exceed 3000, diſtributed in a few pariſhes, which might be officiated by a ſmall number of prieſts: yet, through a monſtrous inconſiſtency, that falls very heavy on the poor inhabitants, they have to maintain no leſs than 3 convents of friars, and as many of nuns, beſides near 60 prieſts!

(6.) ARBE, SOIL AND PRODUCE OF. The ſoil of Arbe is not the ſame in every ſituation; nay, it would be difficult to find a country where there is ſo great a variety in ſo little ſpace. There is a very great difference between the ground of the extremity of the mountain above the channel of Barbado, and the ſides of it on the one part towards the iſland, and on the other facing the ridge of Morlacca. Nor is the top of the mountain itſelf always of the ſame ſtructure; for in ſome parts it is extended in a fine level plain, partly woody and partly cultivable; in other places it is quite rocky, and compoſed of bare marble. The ground at the foot of the mountain, where it ſtretches towards the ſhore, oppoſite to Jablanaz, is nothing but marble; and, in the diſtrict of Barbado it is gravelly, and a good ſoil for vines. The wine of Barbado is of excellent quality, and in great eſtimation; hardly any other product is cultivated along the coaſt, as the vines ſucceed ſo well, notwithſtanding the negligent culture. Below the ruins of Colento the land bears vines, olives, mulberry, and other fruit trees, and alſo corn in the loweſt parts. All the lower part of the iſland is compoſed alternatively of hills and valleys, and of a ſubſtance for the moſt part very different from that of the mountain and its adjacencies. As the organization of the mountain is wholly of marble, ſo that of the hills is generally arenaceous. The whetſtone forms a large part, and frequently contains *oſtracites* and *lenticulares*; the exterior ſtratum is commonly friable. The valley, which according to appearances ſhould be full of ſand, are provided with an excellent ſoil, with ſuch a mixture of very minute ſand as is requiſite to keep it light. Springs of freſh water are by nature well diſtributed over the iſland, and maintain a proper humidity when the ſummer is not exceſſively dry; ſo that the dark verdure of the hills covered with wood, the luxuriance of the vines, and freſhneſs of the corn ground, form a ſpectacle extremely cheerful and agreeable.—The iſland of Arbe would have every thing requiſite for the ſubſiſtence of its ſmall population, if the land was cultivated by a people leſs ſtupid and lazy. It produces, however, firewood, of which many cargoes are annually ſent to Venice; corn, oil, excellent wine, brandy, and ſilk, ſince very ancient times; it alſo exports hides, wool, ſheep, hogs, and horſes of a good breed. There is alſo abundance of good ſalt made on the iſland; and the fiſhing of tunny and mackrel, notwithſtanding it is managed in a ſlowly and aukward manner, makes no inconſiderable article of trade to the Arbegiani, who, like all their neighbours, find their account in ſelling this commodity to ſtrangers rather than to the Venetians. Yet, with all theſe natural products, the iſland is very far from being rich, or even in a tolerably flouriſhing ſtate; becauſe there is much land left uncultivated, and the peaſants are lazy.

ARBEGIANI, the inhabitants of ARBE. See N° I. II. § 3, 5, 6.

(1.) ARBELA, in ancient geography, a city of Aſſyria, famous for the 3d and deciſive battle fought near it, between Alexander the Great and Darius Codomannus. See § 2. It is ſeated on the Lycus, on a fine plain, 60 miles SE. of Mouſul the ancient Nineveh, and is now called IRBIL. Lon. 44. 12. E. Lat. 35. 15. N.

(2.) ARSELA, BATTLE OF. This battle was fought A. A. C. 331, and the event of it determined the fate of the Perſian empire. Arrian relates, that Darius's army conſiſted of a million of foot and 40,000 horſe; according to Diodorus, there were 200,000 horſe and 800,000 foot; Plutarch relates, that the horſe and foot together made up a million; and Juſtin gives us exactly half Diodorus's number. The Macedonian army, according to Arrian, conſiſted of 40,000 foot and 7000 horſe. Upon receiving notice of the vaſt ſtrength of the enemy, Alexander expreſſed neither ſurpriſe nor apprehenſion; but having (as Dr Gillies deſcribes it in his Hiſt. of Anc. Greece) "commanded a halt, he encamped four days, to give his men reſt and refreſhment. His camp being fortified by a good entrenchment, he left in it the ſick and infirm, together with all the baggage; and, on the evening of the 4th day, prepared to march againſt the enemy with the effective part of his army, which was ſaid to conſiſt of 40,000 infantry and 7000 horſe, unincumbered with any thing but their proviſions and armour. The march was undertaken at the 2d watch of the night, that the Macedonians, by joining battle in the morning, might enjoy the important advantage of having an entire day before them, to reap the full fruits of their expected victory. About half way between the hoſtile camps, ſome eminences intercepted the view of either army.—Having aſcended the riſing ground, Alexander firſt beheld the Barbarians, drawn up in battle array, and perhaps more ſkilfully marſhalled than he had reaſon to apprehend. Their appearance, at leaſt, immediately determined him to change his firſt reſolution. He again commanded a halt, ſummoned a council of war; and different meaſures being propoſed, acceded to the ſingle opinion of Parmenio, who adviſed that the foot ſhould remain ſtationary until a detachment of horſe had explored the field of battle, and carefully examined the diſpoſition of the enemy. Alexander whoſe conduct was equalled by his courage, and both ſurpaſſed by his activity, performed thoſe important duties in perſon at the head of his light horſe and royal cohort. Having returned with unexampled celerity, he again aſſembled his captains, and encouraged

couraged them by a ſhort ſpeech. Their ardour correſponded with his own; and the ſoldiers, confident of victory, were commanded to take reſt and refreſhment. Meanwhile Darius, perceiving the enemy's approach, kept his men prepared for action. Notwithſtanding the great length of the plain, he was obliged to contract his front, and form in two lines, each of which was extremely deep. According to the Perſian cuſtom, the king occupied the centre of the firſt line, ſurrounded by the princes of the blood and the great officers of his court, and defended by his horſe and foot guards, amounting to 15,000 choſen men. Theſe ſplendid troops, who ſeemed fitter for parade than battle, were flanked on either ſide by the Greek mercenaries and other warlike battalions, carefully ſelected from the whole army. The right wing conſiſted of the Medes, Parthians, Hyrcanians, and Sacæ; the left was chiefly occupied by the Bactrians, Perſians, and Cardueans. The various nations compoſing this immenſe hoſt were differently armed, with ſwords, ſpears, clubs, and hatchets; while the horſe and foot of each diviſion were promiſcuouſly blended, rather from the reſult of accident than by the direction of deſign. The armed chariots fronted the firſt line, whoſe centre was farther defended by the elephants.—Choſen ſquadrons of Scythian, Bactrian, and Cappadocian cavalry advanced before either wing, prepared to bring on the action, or after it began, to attack the enemy in flank and rear. The unexpected approach of Alexander within ſight of his tents prevented Darius from fortifying the wide extent of his camp; and, as he dreaded a nocturnal aſſault from enemies who often veiled their deſigns in darkneſs, he commanded his men to remain all night under arms. This unuſual meaſure, the gloomy ſilence, the long and anxious expectation, together with the fatigue of a reſtleſs night, diſcouraged the whole army, but inſpired double terror into thoſe who had witneſſed the miſerable diſaſters on the banks of the Granicus and the Iſſus. At day-break Alexander diſpoſed his troops in a manner ſuggeſted by the ſuperior numbers and deep order of the enemy.—His main body conſiſted in two heavy-armed phalanxes, each amounting to above 16,000 men.—Of theſe the greater part formed into one line; behind which he placed the heavy-armed men, reinforced by his targeteers, with orders, that when the out-ſpreading wings of the enemy preſſed to attack the flanks and rear of the firſt line, the ſecond ſhould immediately wheel to receive them. The cavalry and light infantry were ſo diſpoſed on the wings, that while one part reſiſted the ſhock of the Perſians in front, another, by only facing to the right or left, might take them in flank. Skilful archers and darters were poſted at proper intervals, as affording the beſt defence againſt the armed chariots, which (as Alexander well knew) muſt immediately become uſeleſs whenever their conductors or horſes were wounded. Having thus arranged the ſeveral parts, Alexander with equal judgment led the whole in an oblique direction towards the enemy's left; a manœuvre which enabled the Macedonians to avoid contending at once with ſuperior numbers. When his advanced battalions, notwithſtanding their nearneſs to the enemy, ſtill ſtretched towards the right, Darius alſo extended his left, till fearing that by continuing this movement his men ſhould be drawn gradually off the plain, he commanded the Scythian ſquadrons to advance, and prevent the farther extenſion of the hoſtile line. Alexander immediately detached a body of horſe to oppoſe them. An equeſtrian combat enſued, in which both parties were reinforced, and the barbarians finally repelled. The armed chariots then iſſued forth with impetuous violence; but their appearance was only formidable; for the precautions taken by Alexander rendered their aſſault harmleſs. Darius next moved his main body, but with ſo little order, that the horſe, mixed with the infantry, advanced, and left a vacuity in the line, which his generals wanted time or vigilance to ſupply. Alexander ſeized the deciſive moment, and penetrated into the void with a wedge of ſquadrons. He was followed by the neareſt ſections of the phalanx, who ruſhed forward with loud ſhouts, as if they had already purſued the enemy. In this part of the field, the victory was not long doubtful; after a feeble reſiſtance, the barbarians gave way; and the puſillanimous Darius was foremoſt in the flight. The battle, however, was not yet decided. The more remote diviſions of the phalanx, upon receiving intelligence that the left wing, commanded by Parmenio, was in danger, had not immediately followed Alexander. A vacant ſpace was thus left in the Macedonian line, through which ſome ſquadrons of Perſian and Indian horſe penetrated with celerity, and advanced to the hoſtile camp. It was then that Alexander derived ſignal and well-earned advantages from his judicious order of battle. The heavy armed troops and targeteers, which he had ſkilfully poſted behind the phalanx, ſpeedily faced about, advanced with a rapid ſtep, and attacked the barbarian cavalry, already entangled among the baggage. The enemy, thus ſurpriſed, were deſtroyed or put to flight. Meanwhile the danger of his left wing recalled Alexander from the purſuit of Darius. In advancing againſt the enemy's right, he was met by the Parthian, Indian, and Perſian horſe, who maintained a ſharp conflict. Sixty of the *Companions* fell; Hephæſtion, Cœnus, and Meridas, were wounded.—Having at length diſſipated this cloud of cavalry, Alexander prepared to attack the foot in that wing. But the buſineſs was already effected, chiefly by the Theſſalian horſe; and nothing remained to be done, but to purſue the fugitives, and to render the victory as deciſive as poſſible. According to the leaſt extravagant accounts, with the loſs of 500 men he deſtroyed 40,000 of the barbarians, who never thenceforth aſſembled in ſufficient numbers to diſpute his dominion in the Eaſt. The invaluable provinces of Babylonia, Suſiana, and Perſis, with their reſpective capitals of Babylon, Suſa and Perſepolis, formed the prize of his ſkill and valour. The gold and ſilver found in thoſe cities amounted to thirty millions Sterling; the jewels and other precious ſpoil, belonging to Darius, ſufficed, according to Plutarch, to load 20,000 mules and 5000 camels." The conſequences of this victory the reader will find under the article PERSIA.

ARBELLA, a small town of Ireland, in the county of Kerry, and province of Munster, near the ruins of Ballycarthy Castle, 138 miles from Dublin.

ARBERG, or AARBERG, a fortified town of Switzerland, in the canton of Bern, with a handsome castle, where the bailiff resides. It is seated on the river Aar, in a kind of island, 10 m. NW. of Bern, and 12 SW. of Soleure. Lon. 7. 5. E. Lat. 47. 0. N.

ARBES, a city of Tunis, seated in a beautiful plain, and watered by many fine springs, 2 days journey S. of Bona. It contains many relics of Roman inscriptions, &c.

(1.) ARBIRLOT, a parish of Scotland, on the sea coast, in the county of Forfar; 4 miles long and 3 broad. The climate is healthy, the surface hilly, and the soil so extremely various, that it often differs in the same field. In general, however, it is fertile, agriculture having been rapidly improved within these 20 years. It produces oats, barley, wheat, turnips and lint. Great attention is paid to the breeding of cattle, but there is not a single flock of sheep in the parish, notwithstanding the advantage of the hilly grounds. The rents are moderate, the roads good, and the statute labour and thirlages are commuted. The population, in 1790, by Mr Watson's report to Sir J. Sinclair, was 1055 souls. There are several mineral springs in the parish.

(2.) ARBIRLOT, a village in the above parish, (See N° 1.) seated on the Elliot; whence the original name of both, ABERELLIOT, the word *aber*, in Gaelic, signifying *above*. In the ancient British, it has a sense somewhat different. See ABER.

ARBISTOCK, a parish of N. Wales, in Denbighshire.

(1.) * ARBITER. *n. s.* [Lat.] 1. A judge appointed by the parties, to whose determination they voluntarily submit.—He would put himself into the king's hands, and make him *arbiter* of the peace. *Bacon.* 2. One who has the power of decision or regulation; a judge.—His majesty, in this great conjuncture, seems to be generally allowed for the sole *arbiter* of the affairs of Christendom. *Temple.*

(2.) ARBITER, in the civil law, implies also a judge nominated by a magistrate, to decide differences, between parties. The civilians make a difference between ARBITER and ARBITRATOR, though both found their power on the compromise of the parties; the former being obliged to judge according to the customs of the law, whereas the latter is at liberty to use his own discretion, and accommodate the difference in the manner that appears to him most just and equitable.

* ARBITRABLE. *adj.* [from *arbitror*, Lat.] Arbitrary; depending upon the will.—The ordinary revenue of a parsonage is in land, called the glebe: in tythe, a set part of our goods rendered to God; in other offerings bestowed upon God by the people, either in such *arbitrable* proportion as their own devotion moveth them, or as the laws or customs of particular places do require them. *Spelman.*

ARBITRAGE, the decree of an arbitrator.—See ARBITRATION, § 1 and 2.

* ARBITRAMENT. *n. s.* [from *arbitror*, Lat.] Will; determination; choice. This should be written *arbitrement*.—

Stand fast! to stand or fall,
Free in thine own *arbitrament* it stands,
Perfect within, no outward aid require;
And all temptations to transgress repel. *Milton.*

* ARBITRARILY. *adv.* [from *arbitrary*.] With no other rule than the will; despotically; absolutely.—He governed *arbitrarily*, he was expelled; and came to the deserved end of all tyrants. *Dryden.*

* ARBITRARINESS. *n. s.* [from *arbitrary*.] Despoticalness; tyranny.—He that by harshness of nature, and *arbitrariness* of command, uses his children like servants, is what they mean by a tyrant. *Temple.*

* ARBITRARIOUS. *adj.* [from *arbitrarius*, Lat.] Arbitrary; depending on the will.—They are standing and irrepealable truths, such as have no precarious existence, or *arbitrarious* dependence upon any will or understanding whatsoever. *Norris.*

* ARBITRARIOUSLY. *adv.* [from *arbitrarius*.] Arbitrarily; according to mere will and pleasure.—Where words are imposed *arbitrariously*, distorted from their common use, the mind must be led into misprision. *Glanville.*

* ARBITRARY. *adj.* [*arbitrarius*, Lat.] 1. Despotick; absolute; bound by no law; following the will without restraint. It is applied both to persons and things.—

In vain the Tyrian queen resigns her life
For the chaste glory of a virtuous wife,
If lying bards may false amours rehearse,
And blast her name with *arbitrary* verse. *Waller.*
Their regal tyrants shall with blushes hide
Their little lusts or *arbitrary* pride,
Nor bear to see their vassals ty'd. *Prior.*

2. Depending on no rule; capricious.—It may be perceived, with what insecurity we ascribe effects depending on the natural period of time, unto *arbitrary* calculations, and such as vary at pleasure. *Brown's Vulgar Errours.*

ARBITRARY POWER. See DESPOTISM, MONARCHY, &c.

ARBITRARY PUNISHMENT, in law, denote such punishments as are by statute left to the discretion of the judge. It is a general rule in arbitrary punishments, that the judge cannot inflict death. Hence all punishments that are not capital have acquired the name of *arbitrary punishments*, even although they be expressly pointed out by statute.

(1.) * *To* ARBITRATE. *v. a.* [*arbitror*, Lat.] 1. To decide; to determine.—

This might have been prevented, and made whole,
With very easy arguments of love,
Which now the manage of two kingdoms must
With fearful bloody issue *arbitrate*. *Shakesp.*

2. To judge of.—

Yet where an equal poise of hope and fear
Does *arbitrate* th' event, my nature is
That I incline to hope, rather than fear. *Milton.*

(2.) * *To* ARBITRATE. *v. n.* To give judgment.—It did *arbitrate* upon the several reports of sense, not like a drowsy judge, only hearing, but also directing their verdict. *Search.*

(1.) * ARBI-

(1.) * ARBITRATION. *n. f.* [from *arbitror*, Lat.] The determination of a cauſe by a judge mutually agreed on by the perſons contending.

(2.) ARBITRATION, in law, is where the parties, injuring and injured, ſubmit all matters in diſpute, concerning any perſonal chattels or perſonal wrong, to the judgment of two or more arbiters or arbitrators; who are to decide the controverſy: and if they do not agree, it is uſual to add, that another perſon be called in as umpire (*imperator* or *impar*,) to whoſe ſole judgment it is then referred. Sometimes there are only one arbitrator originally appointed. This deciſion, in any of theſe caſes, is called an *award*. And thereby the queſtion is as fully determined, and the right transferred or ſettled, as it could have been by the agreement of the parties, or judgment of a court of juſtice. See LAW.

* ARBITRATOR. *n. f.* [from *arbitrate*.] 1. An extraordinary judge between party and party, choſen by their mutual conſent. *Cowel.*—

Be a good ſoldier, or upright truſtee,
An *arbitrator* from corruption free. *Dryden.*

2. A governor; a preſident.—

Though heav'n be ſhut,
And heav'n's high *arbitrator* ſit ſecure
In his own ſtrength, this place may be expos'd.
Milton.

3. He that has the power of preſcribing to others without limit or controul.—Another Blenheim or Ramillies will make the confederates maſters of their own terms, and *arbitrators* of a peace. *Addiſon on the State of the War.* 4. The determiner; he that puts an end to any affair.—

The end crowns all;
And that old common *arbitrator*, time,
Will one day end it. *Shakeſp.*

* ARBITREMENT. *n. f.* [from *arbitror*, Lat.] 1. Deciſion; determination.—I know the knight is incenſed againſt you, even to a mortal *arbitrement*; but nothing of the circumſtance more, *Shakeſpeare.* 2. Compromiſe.—Lukewarm perſons think they may accommodate points of religion by middle ways, and witty reconcilements; as if they would make an *arbitrement* between God and man. *Bacon.*

ARBLASTER, a croſs-bow. *Chaucer.*

ARBOGA, an ancient and neat inland town of Sweden, in Weſtmania, ſeated on the Storae, a little above where it falls into the Maerler Lake, 66 miles W. of Stockholm.

ARBOIS, a ſmall populous town of France, in the department of Jura, famous for its wines. It is ſituated 18 miles SE. of Dole, and 22 SW. of Beſançon. Lon. 5. 40. E. Lat. 46. 55. N.

ARBON, an ancient town of Switzerland, on the S. banks of the lake of Conſtance, in Thurgaw. It has a caſtle built by the Romans, and is under the juriſdiction of the biſhop of Conſtance. In time of war, the Swiſs have a right to put in a garriſon. The Popiſh and Proteſtant religions are equally tolerated in it. It is ſituated 8 miles N. of St Gall, and 12 SE. of Conſtance. Lon. 9. 30. E. Lat. 4. 38. N.

(1.) ARBOR, in botany, a tree. Trees are by Linnæus claſſed in the ſeventh family of the vegetable kingdom, and are diſtinguiſhed from ſhrubs in that their ſtems come up with buds on them; but this diſtinction holds not univerſally, there being rarely any buds on the large trees in India.

(2.) ARBOR, in chemiſtry, or ARBOR PHILOSOPHICA, is a name common to ſeveral metalline cryſtallizations; thus called from their ramifications reſembling a tree. Albertus Magnus is ſaid to have produced a tree, before the king of France while he ſat at dinner. This paſſed at that time for a palingeneſia, or reſuſcitation; but it may more naturally be referred to the ſpecies of germinations by cryſtallizations.

(3.) ARBOR, in mechanics, the principal part of a machine, which ſerves to ſuſtain the reſt; alſo the axis or ſpindle on which a machine turns, as the arbor of a crane, windmill, &c.

* ARBORARY. *adj.* [*arborarius*, Lat.] Belonging to a tree. *Dict.*

ARBOR DIANÆ, or ARBOR LUNÆ, a kind of cryſtallization, in which *aqua fortis* incorporated with ſilver and mercury, being put in water, expands and ſhoots itſelf into an appearance of a tree, with branches, leaves, and flowers. See CHEMISTRY, *Index.*

* ARBOREOUS. *adj.* [*arboreus*, Lat.] 1. Belonging to trees; conſtituting a tree.—A grain of muſtard becomes *arboreous*. *Brown.* 2. A term in botany, to diſtinguiſh ſuch funguſes or moſſes as grow upon trees, from thoſe that grow on the ground. *Quincy.*—They ſpeak properly, who make it an *arboreous* excreſcence, or rather a ſuperplant bred of a viſcous and ſuperfluous lopp, which the tree itſelf cannot aſſimulate. *Brown's Vulgar Err.*

ARBORESCENT, an epithet applied to ſuch objects as reſemble trees, or that grow up in the form of trees. See ARBOR.

ARBORESCENT STAR-FISH, in zoology, a ſpecies of aſterias. See ASTERIAS.

* ARBORET. *n. f.* [*arbor*, Lat. a tree.] A ſmall tree or ſhrub.—

Now hid, now ſeen,
Among this woven *arborets*, and flow'rs,
Imbroider'd on each bank. *Milton.*

ARBOR GENEALOGICA, tree of genealogy, or conſanguinity, ſignifies a lineage drawn out under the reſemblance of a root, ſtock, branches, &c.

ARBOR HERMETIS, *i. e.* the tree of hermes, among chemiſts, a proceſs of the revivification of mercury.

ARBORIBONZES, in modern hiſtory, prieſts of Japan, who live an erratic life, and ſubſiſt on alms. They dwell in caverns, and cover their heads with bonnets made of the bark of trees.

ARBORIS PECTEN. See PECTEN.

* ARBORIST. *n. f.* [*arboriſte*, Fr. from *arbor*, a tree.] A naturaliſt who makes trees his ſtudy.—The nature of the mulberry, which the *arboriſts* obſerve to be long in the begetting his buds; but the cold ſeaſons being paſt, he ſhoots them all out in a night. *Howel's Vocal Foreſt.*

ARBOR JUDÆ, a tree, ſo named by ſome botaniſts, who ſuppoſed it to be of that kind on which Judas hanged himſelf.

ARBOR LUNÆ. See ARBOR DIANÆ.

(1.) ARBOR MARTIS, in chemiſtry, is a germination of iron, reſembling a natural plant. It is the invention of the younger Lemery. On a diſſolution of iron filings in ſpirit of nitre contained in a glaſs, be poured oil of tartar *per deliquium*: upon this the liquor ſoon ſwelled very conſiderably,

though with very little fermentation. When this ſubſided there appeared branches adhering to the ſurface of the glaſs, which, continuing to grow, at length covered it all over. The ſcrm of the branches was ſo perfect, that one might even diſcover a kind of leaves and flowers thereon.

(2.) ARBOR MARTIS, in natural hiſtory, is applied to coral, becauſe it grows like a tree in the ſea.

* ARBOROUS. *adj.* [from *arbor*, Lat.] Belonging to a tree.—

From under ſhady *arborous* roof
Soon as they forth were come to open ſight
Of day-ſpring, and the ſun. *Milton.*

ARBOR PHILOSOPHICA. See ARBOR, § 2.

ARBOR PORPHYRIANA, among the ſchoolmen, a fanciful literary figure, conſiſting of three columns of words; the middlemoſt whereof contains the ſeries of genera and ſpecies, and bears analogy to the trunk; and the extremes, containing the differences, to the branches of a tree. Thus, *e. g.*

	SOCRATES.	
Greeks.	ANTONINUS, &c.	Romans.
Rational animals.	MAN.	Irrational animals.
Animate bodies.	ANIMAL.	Inanimate bodies.
Thinking ſubſtances.	BODY.	Extended ſubſtances.
	SUBSTANCE.	

ARBOR SCIENTIÆ, a general ſcheme of ſcience.

ARBOR VINE. See CONVOLVULUS.

ARBOR VITÆ. See THUYA.

(I.) * ARBOUR. *n. ſ.* [from *arbor*, Lat. a tree.] A bower; a place covered with green branches or trees.—Nay, you ſhall ſee mine orchard, where, in an *arbour*, we will eat a laſt year's pippen of my own graffing. *Shakeſpeare.*—

For noon-day's heat are cloſer *arbours* made,
And for freſh ev'ning air the op'ner glade.
Dryden.

(II.) ARBOUR, in gardening, a kind of ſhady bower, formerly in great eſteem; but of late rejected on account of its being damp and unwholeſome. To prevent this, arbours ſhould have openings to admit of free ventilation, as well as of the rays of the ſun. They are diſtinguiſhed into *natural* and *artificial*.

1. ARBOURS, ARTIFICIAL, and cabinets, are made of lattice work, borne up by ſtandards, croſs rails, circles, and arches of iron. For theſe arbours, they uſe ſmall fillets of oak, which being planted, and made ſtraight, are wrought in chequers, and faſtened with wire.

2. ARBOURS, NATURAL, are formed only of the branches of trees, interwoven artfully, and borne up by a ſtrong lattice-work, poles, hoops, &c. which make galleries, halls, porticoes, and green viſtas, naturally covered. The trees wherewith theſe arbours are formed, are uſually the female elm, or lime-tree; becauſe they eaſily yield, and, by their great quantity of ſmall boughs, form a thick bruſh-wood; the lower parts are uſually filled up with horn-beams, honeyſuckles, jaſmines, &c.

* ARBOUR VINE. A ſpecies of bindweed; which ſee.

(1.) ARBROATH, a pariſh of Scotland, in Forfarſhire, comprehencing little more than the town, (See N° 2.) and containing 4676 inhabitants, in 1792, of which only 131 belonged to the country part. There are 517 more females than males in it. The climate is dry and healthy. Many live to 70 and 80, and ſome above 90 years of age.—Mr Gleig mentions two perſons of 96 and 97, alive in 1792. The ſoil is various.

(2.) ARBROATH. Though we have already given a deſcription of this town under the article ABERBROTHICK, we ſhall, under this, its more common name, add a few particulars from Sir J. Sinclair's Statiſtical Account, narrated by Mr Gleig; from which, as to its trade and number of inhabitants, it has varied little theſe laſt 15 years; unleſs it be that the manufacturing of cotton goods has lately been introduced. It is governed by a provoſt, two bailies, and 16 counſellors; and has 7 incorporated trades. Previous to 1736, it had hardly any commerce, but in Nov. 1791, its manufactures of Osnaburghs and brown linens, for one year only, amounted to 1,055,303 yards; valued at L. 39,660 : 2 : 10 d.; and the fail cloth manufacture, in which about 500 looms are employed, produces annually about as much. Its annual imports of flax and hempſeed are between 700 and 800 tons; of wood and iron about L. 4000: of lime ſhells about 18,000 bolls, and of coals about 7000 tons. It has a tan yard, wherein hides are tanned, to the value of L. 2000 yearly; and 34 veſſels, which carry 1050 tons, beſides fiſhing boats. The number of its inhabitants, in 1792, was exactly 5183, but of theſe, 648 belonged to the pariſh of St Vigean's, to which Arbroath was formerly conjoined. In 1781, the town was threatened to be deſtroyed by Capt. Fall, of the Fearnought, French privateer, unleſs the magiſtrates would give L. 30,000 for its ranſom. They, however, took ſuch prudent ſteps, by arming the inhabitants, and procuring military aid from Montroſe, that Fall at laſt ſheared off, without doing farther damage, than knocking down a few chimney tops, although he fired red hot balls for a conſiderable time upon it. To prevent ſuch inſults in future, a battery has been erected, mounting 6 twelve pounders, on the Ballaſt Hill, which has a complete command of the bay.

ARBURG, or AARBURG, a town of Switzerland, in the canton of Bern, on the Aar. It is ſmall, but very ſtrong, being ſeated on a rock, and defended by a good fortreſs cut out of the rock. Lon. 17. 55. E. Lat. 47. 10. N.

ARBURY, the name of 3 Engliſh villages; viz. 1. near Cambridge: 2. in Hertfordſhire, near Aſhwell: and, 3. in Warwickſhire, near Nuneaton.

* ARBUSCLE. *n. ſ.* [*arbuſcula*, Lat.] Any little ſhrub. *Dict.*

ARBUSCULA is uſed by Bradley, to denote a dwarf tree, above the rank of ſhrubs, but below that of trees, ſuch, *e. g.* as the elder.

ARBUSTINE, ſhrubby, or like ſhrubs.

ARBUSTIVA, in botany, an order of plants in the *Fragmenta Methodi Naturalis* of Linnæus.

ARBUSTIVÆ, vines faſtened to trees. See next article.

ARBUSTUM,

ARBUSTUM, implies a number of trees planted for the ſake of the fruit. The word was more peculiarly applied to a place planted with trees for faſtening vines to, which are hence called by Columella *arbuſtivæ*. Arbuſtum is ſometimes alſo uſed to denote an orchard, or field wherein trees are planted at ſuch diſtance that there is room for ploughing and growing corn between.

* ARBUTE. *n. ſ.* [*arbutus*, Lat.] *Arbute*, or ſtrawberry tree, grows common in Ireland. It is difficult to be raiſed from the ſeeds, but may be propagated by layers. It grows to a goodly tree, endures our climate, unleſs the weather be very ſevere, and makes beautiful hedges. *Mortimer.*

Rough *arbute* ſlips into a hazel bough
Are oft ingrafted; and good apples grow
Out of a plain tree ſtock. *May's Virgil.*

ARBUTHIE, a diſtrict of Scotland, in the county of Mearns.

(1.) ARBUTHNOT, Aexander, principal of the univerſity of Aberdeen, in the reign of James VI. of Scotland, was born in 1538. He ſtudied firſt at Aberdeen; and was afterwards ſent over to France, where, under the famous Cujacius, he applied himſelf to the civil law. In 1563, he returned to Scotland and took orders. In 1568, he was appointed miniſter of Arbuthnot and Logy-Buchan; and in 1569, made principal of the King's College at Aberdeen. In the general aſſembly which met at Edinburgh, in 1573 and 1577, he was choſen moderator; and, to the end of his life, was an active ſupporter of the reformed religion. He died in 1583, in the 45th year of his age; and was buried in the College Church of Aberdeen. We are told, in the Biographia, that he was eminent as a poet, a philoſopher, a mathematician, a lawyer, a divine, and a phyſician. He wrote *Orationes de Origine & Dignitate Juris*, printed at Edinburgh, 1572, 4to. His cotemporary Thomas Maitland wrote a copy of Latin verſes on the publication of this book: they are printed in the *Delic. Poetar. Scot.* He publiſhed Buchanan's Hiſtory of Scotland, in 1582.

(2.) ARBUTHNOT, a pariſh of Scotland, in Mearns-ſhire, anciently called ABERBUTHENOTH, about 6 miles in length, and 3 in breadth. The ſoil is various, and the climate healthy, though wet. By the exertions of Mr Barclay of Ury, agriculture is much improved, and the value of the land increaſed fourfold. Its population about 1790, was 1041, being nearly the ſame it was in 1774.

(3.) ARBUTHNOT, a ſmall village in the above pariſh, (N° 2.) which contains about 20 houſes, moſtly occupied by tradeſmen.

(4.) ARBUTHNOT, John, M. D. was born in the pariſh of ARBUTHNOT, (See N° 2.) and was educated and graduated at Aberdeen. He was the ſon of Alexander Arbuthnot, epiſcopal miniſter of that pariſh, who was deprived for nonconformity, in 1689. The difficulties in which his family was involved, on account of their political principles, determined him to go to London, where for ſome time he taught mathematics; and while he was thus employed, he publiſhed his *Examination of Dr Woodward's Account of the Deluge*. This tract, which abounded with learning and good ſenſe, made him known. He publiſhed ſoon after, his *Eſſay on the Uſefulneſs of Mathematics*. In the profeſſion of phyſic, he advanced by ſlow but ſure degrees; and his reputation in it, was at length fully eſtabliſhed, by a ſucceſsful cure which he performed on Prince George of Denmark. Queen Anne, in conſequence of it, appointed him one of her phyſicians in ordinary, in 1709; and, ſome years before this his extenſive knowledge had procured his admiſſion into the Royal Society. His talents and worth were his ſtrongeſt recommendations to men of wit and learning; and he entered into particular connections with Pope and Swift, with whom he joined in publiſhing ſeveral volumes of miſcellanies; among which are the well known *Memoirs of Martinus Scriblerus*, a ſatire of infinite humour, on the abuſes of human learning. In 1715, he aſſiſted Pope and Gay in the *Three Hours after Marriage*; a dramatic performance, which was brought upon the ſtage without ſucceſs. In 1727, he publiſhed *Tables of ancient Coins, Weights, and Meaſures*; a work of great uſe and real erudition. In 1732, his valuable tract concerning *The Nature and Choice of Aliments* appeared; which, the year after, was followed by his remarks on *The Effects of Air on human Bodies*. A conſtitutional aſthma had diſtreſſed him at different periods of his life, and proved fatal to him in 1734. Dr Arbuthnot appears to have been in all reſpects a moſt accompliſhed and amiable perſon. He has ſhowed himſelf equal to any of his cotemporaries in wit and learning, and he was ſuperior to moſt men in the moral duties of life, in acts of humanity and benevolence. His letter to Mr Pope, written as it were upon his death bed, and which no one can read without emotion, diſcovers ſuch a noble fortitude of mind at the approach of his diſſolution, as could be inſpired only by a clear conſcience, and the calm retroſpect of an uninterrupted courſe of virtue. In 1751, came out, in two vols. 8vo. printed at Glaſgow, *The miſcellaneous Works of the late Dr Arbuthnot*; which are ſaid to comprehend, with what is inſerted in Swift's Miſcellanies, all the pieces of wit and humour, of this admirable author; but the greater part of them is denied by his ſon to be his compoſition. When his attention was attracted by any comical occurrence, he generally wrote his thoughts upon it in a large folio which he kept in his parlour; and from this probably ſome ſlight and imperfect eſſays, which had ſlipt from his memory, might get abroad into the world. A vein of good natured pleaſantry runs through all his pieces of this kind; and this ſerves to confirm the character Swift gave of him to a lady deſiring to know his opinion of Dr Arbuthnot: "He has more wit than we all have, and his humanity is equal to his wit."

ARBUTUS, the STRAWBERRY TREE: A genus of the monogynia order, belonging to the decandria claſs of plants; and in the natural method ranking under the 18th order, bicornes. The calyx is divided into 5 parts; the corolla is ovated; and the fruit is a berry with 5 cells. There are 5 ſpecies: viz.

I. ARBUTUS ACADIENSIS, a native of Acadia.

II. ARBUTUS ALPINA, or MOUNTAIN STRAWBERRY TREE, a native of Britain.

III. Ar-

III. ARBUTUS ANDRACHNE, or the ORIENTAL STRAWBERRY TREE; ſo called, becauſe it grows plentifully in many parts of the Eaſt; where the natives uſe it for various purpoſes. It grows to a very large ſize. The leaves are ſmooth, and nearly of the ſame figure as the arbutus unedo, (See N° IV.) though they are larger, and have their edges undivided. The flowers grow like the other ſorts; are of the ſame colour; and ſucceeded by large, oval, ſcarlet fruit. The andrachne may be propagated in the ſame manner as the unedo: But the plants muſt be preſerved in pots for 3 or 4 years, till they have obtained ſtrength; and may be then planted in a warm ſituation, and on a dry ſoil, for this ſpecies will not thrive on wet ground.

IV. ARBUTUS UNEDO, or common ſtrawberry tree, is a native of Italy, Spain, and Ireland; and is now very common in the Britiſh gardens. Of this ſpecies there are four varieties, viz. The oblong fruited, the round fruited, the red flowered, and the double bloſſomed. One deſcription is nearly common to them all; and their inconſiderable variation is almoſt ſufficiently ſhown in their reſpective appellations.

(1.) ARBUTUS UNEDO, THE DOUBLE BLOSSOMED, differs from the others, only in that the flowers are double; but this difference is ſo inconſiderable, that it will not be ſeen without looking into the flower; and even then the doubleneſs will appear ſo trifling as ſcarcely to merit notice; ſo that a plant or two, to have it ſaid, that the collection is not without it, will be ſufficient. Neither ought any more to be admitted; for they will not produce the ſame plenty of fruit, which conſtitutes the chief property of theſe trees, as the ſingle ſorts.

(2.) ARBUTUS UNEDO, THE OBLONG FRUITED, grows to be a middle ſized tree in ſome countries; for we read of the large uſes its wood has been applied to; ſuch as, *Arbutea crates*, &c. Arbutean harrows, &c. With us it may be kept down to any ſize. The main ſtems are covered with a light brown bark, rough, and falling. The younger branches are of a kind of purple colour, whilſt the laſt year's ſhoots are of a fine red, and a little hairy. The leaves grow alternately on the branches, and are of an oblong oval figure. They ſtand on ſhort footſtalks, and the oldeſt leaves make a contraſt with the younger by having their footſtalk and mid rib of a fine ſcarlet colour. They are ſmooth, and beautifully ſerrated. Their upper ſurface (as in moſt trees) is of a ſtronger green than their under; and the young twigs are garniſhed with them in plenty. Theſe are beauties in common to moſt trees, in ſome degree or other; but every thing elſe almoſt of this tree that preſents itſelf to conſideration is ſingular: The time of its flowering will be in November and December; when it is rather ſingular to ſee a tree in the open ground in full blow; and the fruit ripens by that time twelvemonth after. The manner and nature of the fruit, which look like very large red ſtrawberries, give it alſo a ſingular and delightful look; and this is heightened as they appear all over the tree among the flowers; for that is the time of its being ripe, when the flowers for the ſucceeding crop are fully out. The flowers themſelves make no great figure; they are of a kind of whitiſh yellow colour; and are ſucceeded by the above-mentioned ſtrawberry fruit, which require a year to arrive at their maturity and colour. The flowers of the firſt ſort are larger than thoſe of the ſecond; and the fruit is oval, and much larger than our common ſcarlet ſtrawberry.

(3.) ARBUTUS UNEDO, THE RED-FLOWERED, differs in no reſpect from the common ſort, only the flowers are red, and theſe conſtitute a variety from the other ſorts of flowers; but the contraſt is not ſo great between their fruit and them as of the other ſorts, their colour approaching too near to a fameneſs.

(4.) ARBUTUS UNEDO, THE ROUND-FRUITED, has pitcher ſhaped flowers, which are ſucceeded by a round ſcarlet fruit, as wide as they are long; and this is all the difference between this and the oblong fruited ſort.

(5.) ARBUTUS UNEDO, CULTURE OF THE. All the above varieties thrive beſt in a wet ſoil, and are ſeldom hurt by hard winters, though the young and tender branches are often deſtroyed by froſt; but, however dead the trees may appear, they ought always to be ſuffered to remain till the following ſummer ſhows what are living and what are dead. The method of propagating the varieties of the unedo is by layers and cuttings: the ſpecies itſelf may be raiſed from ſeed.—1. The operation by layers muſt be performed on the youngeſt twigs; and in ſome ſoils they will ſtrike root pretty freely, whilſt in others they can hardly be made to grow at all: But until they have lain two ſummers, they need ſcarcely be looked for. When the roots are ſtruck, the layers ſhould be carefully taken off in the ſpring, and planted in ſeparate pots; and after well watering them, they ſhould be plunged up to the rims in an hotbed, and this will ſet them forward; for without this aſſiſtance many of the layers will be loſt; ſince they are difficult plants to make grow. After the hotbed has forced the ſeeds into a ſtate of vegetation, the pots may be taken out, and plunged up to the rims in ſome natural mould, to keep them cool and moiſt; and here they may ſtand for two or three years, or longer, if the pots are large enough, without ever removing or ſheltering in winter; for they are hardy enough to reſiſt our ſevereſt cold. When they are to be finally ſet out, all the mould may be turned out of the pots hanging to the roots; and having proper holes made ready, they may be planted in them, and the plant will be ignorant of its new ſituation. 2. The *cuttings* muſt be planted in pots, and have the benefit of a good bark bed: in which being conſtantly ſhaded and duly watered, many of them will grow. As the plants raiſed this way will be rather tender by being forced in the bark bed, it will be neceſſary to remove them into the greenhouſe, or to place them under a hotbed frame during the firſt winter: and after that, the pots may be ſet up to the rims in the ground, and, like the layers, the plants may be turned out at a convenient time into the places where they are to remain. 3. To raiſe them from *ſeeds*, theſe muſt be taken from the oblong or round fruited ſort.

fort. The ſeeds, which will be ripe ſome time in November or the beginning of December, (for they will not be ripe at the ſame time in all places,) muſt be then gathered; and as they ſhould not be ſowed until the ſpring, it will be proper to put them into a pot or jar, mixing with them a quantity of drift ſand; and this will preſerve them found and good. The beginning of March is the beſt time for ſowing the ſeeds; and the beſt ſoil for them is maiden earth, taken from a rich paſture at leaſt a year before, with the ſward; and this, by conſtant turning, being well rotted and mixed, will be ready to receive them. Having filled a ſufficient number of pots with this fine mould, let the ſeeds be ſown, and but juſt covered, ſcarcely a quarter of an inch deep. A dry day ſhould be choſen for the buſineſs; and no watering by the hand ſhould be given them, as it will endanger the ſetting the mould hard in the pots. Leave them abroad until ſome rain falls, which at that time may be hourly expected; and after that, having an hot-bed ready, plunge the pots therein. In leſs than ſix weeks the plants may be expected to appear; when much air ſhould be afforded them, and frequent waterings, in ſmall quantities, gently ſprinkled over them. After this, they may be hardened to the air by degrees, and the pots ſet up to the rims in the natural mould, in a ſhady place. In October they ſhould be removed into the greenhouſe, or ſome ſhelter, in froſty weather; though they ſhould always be ſet abroad in mild open weather. In the ſpring they may be ſhook out, and planted in ſeparate pots; and they ſhould have the advantage alſo of a hotbed to ſet them a growing: their future management may be the ſame as was directed for the layers. When theſe trees are to be planted out, very little regard need be paid to the ſoil or ſituation; for they will grow almoſt any where, and reſiſt our ſevereſt northern blaſts. One thing, however, the gardener muſt conſtantly obſerve, to continue his trees in their beauty, viz. As often as a heavy ſnow falls, to ſhake the boughs; for it will lodge amongſt the leaves and branches in ſuch great quantity as to weigh down and ſplit the largeſt branches; the deformity of which afterwards may be eaſily conceived. Beſides, many years muſt expire before the tree will, if ever it ſhould, grow to its former beauty; to preſerve this, therefore, makes it highly neceſſary to watch theſe trees narrowly in ſnowy weather.

V. ARBUTUS UVA URSI is a plant lately diſcovered in the Highlands of Scotland, and which formerly was thought not to be a native of Britain.

(1.) * ARC. *n. ſ.* [*arcus*, Lat.] 1. A ſegment; a part of a circle; not more than a ſemicircle.—Their ſegments, or *arcs*, for the moſt part, exceeded not the third part of a circle. *Newton's Opticks.* 2. An arch.—

Load ſome vain church with old theatrick ſtate,
Turn *arcs* of triumph to a garden gate. *Pope.*

(2.) ARC. See ARK, and ARCA.

(3.) ARC, or ARCE, a river of France, in the department of Mont Blanc, which riſes in the Maurienne, and falls into the Iſere. Its courſe is very rapid and is full of cataracts.

ARCA, in zoology, a genus of the teſtacea worms in the Linnæan ſyſtem; comprehending 17 ſpecies. The animal is a tethys: the ſhell bivalve and equivalve: and the teeth of the hinge numerous, inſerted between each other.

ARCA CORDIS is uſed by ſome anatomiſts, to denote the pericardium.

(1.) * ARCADE. *n. ſ.* [French.] A continued arch; a walk arched over.—

Or call the winds through long *arcades* to roar,
Proud to catch hold at a Venetian door. *Pope.*

(2.) ARCADE, in architecture, is alſo uſed to denote any opening in the wall of a building formed by an arch.

ARCADES, or ARCADIANS, the inhabitants of ancient ARCADIA. (See N° 1.) Virgil greatly commended them for their love of, and ſkill in, muſic. To imitate the Arcadians, is to labour and toil for the benefit of others, never conquering their own, but the enemies of others. This probably took its riſe from the ancient Arcadians being accuſtomed to hire themſelves out as mercenaries to foreign nations. Homer commends their martial proweſs, their paſtures, their ſheep, and their well watered country. They boaſted of their great antiquity, and that they were older than the ſun and moon! They were the firſt who had a year of three months, and were therefore called *Proſeleni*, becauſe their year was prior to that adjuſted in Greece to the courſe of the moon.

ARCADI, or ARCADIANS, a learned ſociety at Rome. See ACADEMY, § III. N° 1.

(1.) ARCADIA, in ancient geography, an inland diſtrict in the heart of Peloponneſus. It is mountainous, and fitter for paſture than corn; and therefore chiefly celebrated by paſtoral poets, who feigned Pan, the god of ſhepherds, to be the guardian of it. It was bounded on the N. by Achaia; on the E. by Argos and Laconia; by Meſſenia on the S. and Elis on the W. According to Pliny, the wine of this country cured barrenneſs in women, and inſpired the men with rage; and the berries of the yew gathered there were ſo ſtrong a poiſon, that whoever ſlept or took refreſhment under that tree were ſure to die. In Strabo's time there were few cities remaining in it, moſt of them being deſtroyed in the Grecian wars. Euſtathius ſays, that the country was anciently called *Peloſgia*, from Peloſgus, who brought the people, from roots, herbs, and leaves of trees, to feed on acorns, eſpecially beech maſt; as Artemidorus obſerves, that the Arcadians uſually lived on acorns. It was alſo called *Lycaonia*, *Gigantis*, and *Parrhaſia*. It is now called Tzacconia, and full abounds in corn paſture and woods.

(2.) ARCADIA, a ſeaport of the above province, (N° 1.) near the gulf, at the bottom of the iſle of Zante, 64 miles S.W. of Corinth, and 32 N. of Navarin. Lon. 21. 42. E. Lat. 37. 34. N.

ARCADIANS. See ARCADES.

ARCADIUS, [illegible]

archdeacon, on account of his having the cuſtody of the church's cheſt, or treaſure.

ARCANA. See ARCANUM, N° I.

ARCANGIS, in the Turkiſh armies, an inferior kind of infantry, which ſerve as *enfans perdus*, and to harraſs and pillage the enemy's frontiers. The Arcangis are an order inferior to the Janiſaries; and when any of them diſtinguiſh themſelves, are uſually preferred into the Janiſaries order. They have no pay, but ſubſiſt on their plunder.

ARCANNA, a kind of red chalk, called by phyſiologiſts *lubrica labrilis*, as being uſed by carpenters, to colour their lines, for marking timber, &c.

(I.) * ARCANUN. *n. ſ. in the plural* arcanea. A Latin word ſignifying a ſecret.

(II.) ARCANUM, among phyſicians, any remedy, the preparation of which is induſtriouſly concealed, in order to enhance its value. There are alſo ſtanding officinal compoſitions under this denomination; ſuch as,

1. ARCANUM CORALLINUM, a preparation of red precipitate; made by repeatedly diſtilling it with the ſpirit of nitre, till a fine red powder be procured, which being boiled, the water poured off, and tartarized ſpirit of wine put to the powder; two or three cohobations are made; which leave a powder, ſaid to be of uſe in the gout, dropſy, ſcurvy, &c. operates chiefly by ſtool.

2. ARCANUM DUPLICATUM, or double ſecret, is prepared of the *caput mortuum* of aqua fortis, by diſſolving it in hot water, filtrating, and evaporating it to a cuticle; and then leaving it to ſhoot. It is extolled as a diuretic, and ſudorific.—The recipe was purchaſed at the expence of 500 dollars, by that great virtuoſo the duke of Holſtein. Schroder, that prince's phyſician, writes wonders of its great uſes in hypochondriacal caſes, and in continued and intermitting fevers, ſtone, ſcurvy, &c. Mixed with the paſte employed in binding books, it ſecures them effectually againſt all injury from that miſchievous inſect, the BOOK-WORM.

3. ARCANUM DUPLICATUM CATHOLICUM, a compound medicine adminiſtered by Wedelius and others, with great ſucceſs, in a peſtilential fever, attended with dyſentery, which raged for many years in Germany, and yielded to nothing ſo eaſily as to this medicine. It was compoſed of bezoar, plantane root, and the root of *colchicum*.

4. ARCANUM JOVIS is made of an amalgam of mercury and tin, digeſted in ſpirit of nitre; which being drawn off, the remaining matter is wetted with ſpirit of wine, and the ſpirit burnt ſeveral times, till the pungent taſte is wholly gone: what remains is uſed as ſudorific.

5. ARCANUM TARTARI is a neutral ſalt ſoluble in water and ſpirit of wine, formed from the combination of vinegar with fixed alkali.

(III.) ARCANUM, in ancient geography, a villa of Q. Cicero, the orator's brother, in Latium; now ARCE, in the Terra di Lavora, in the kingdom of Naples, on the borders of the Campagna di Roma, on the river Melpis, between Arpinum and Aquinum.

ARCAS, in the mythology, the ſon of Jupiter and Calliſto, who was turned into a ſhe bear by Juno.

ARCBOUTANT, [from *arc*, and *bouter*, to abut, Fr.] in building, an arched buttreſs. See BUTTRESS.

ARCE. See ARCANUM, N° III.

ARCEN-BARROIS, a town of France, in the department of Cote-d'Or, ſeated on the Anjou, 35 miles N. of Dijon, and 13 NW. of Langres. Lon. 5. 7. E. Lat. 47. 55. N.

ARCEONIS, *n. ſ.* in old records, the bow of a ſaddle.

ARCES, a town of France, in the department of Lower Charente.

ARCESILAUS, a celebrated Greek philoſopher, born at Pitane, in Eolis, about A. A. C. 300. He founded the academy, called the *ſecond ſchool*. He was a man of great erudition, and well verſed in the writings of the ancients. He was remarkable for the ſeverity of his criticiſms; but knew how to accommodate himſelf to the age, and purſue the allurements of pleaſure. He had a great number of diſciples. His doctrines were different in ſeveral reſpects from thoſe of the ancient ſchool: and perhaps he was led into this diverſity of opinions by many capital errors in the ancient ſchool, ſuch as the incredible arrogance of the dogmatiſts, who pretended to aſſign cauſes for all things; the myſterious air they had thrown upon the doctrine of ideas; the entirely diſcarding the teſtimony of the ſenſes; the objections of the Pyrrhoniſts, who now began to broach their opinions; the powerful oppoſition of the Stoics and Peripatetics, who diſcovered the feeble parts of the academic philoſophy. Theſe might have given cauſe to reform the ancient ſchool, and to found a new one. The middle ſchool, therefore, laid it down as a principle, that we could know nothing, nor even aſſure ourſelves of the certainty of this poſition; from whence they inferred, that we ſhould affirm nothing, but always ſuſpend our judgment. They advanced, that a philoſopher was able to diſpute upon every ſubject, and bring conviction with him, even upon contrary ſides of the ſame queſtion; for there are always reaſons ſeemingly of equal force both in the affirmative and negative of every argument. According to this doctrine, neither our ſenſes, nor even our reaſon, are to have any credit: and therefore, in common affairs, we are to conform ourſelves to received opinions. Arceſilaus was ſucceeded by his diſciple Lacydes.

ARCEUIL, a village 3 miles S. of Paris, remarkable for an aqueduct, built in 1624, by Mary de Medicis, which ſupplies Paris with water, and is thought to equal ſimilar works of the ancient Romans. See AQUEDUCTS, § 3 and 4.

ARCEUTHOS, *n. ſ.* in botany, the juniper tree.

ARCEUTUM is uſed in ſome ancient law-writers, for a procuration due to a biſhop, abbot, or archdeacon, from their clergy, in time of entertainment.

(I.) * ARCH. *adj.* [from ἀρχὸς, chief.] 1. Chief; of the firſt claſs.—

There is ſprung up
An heretick, an *arch* one, Cranmer. *Shakeſp.*

2. Waggiſh; mirthful; triflingly miſchievous. This ſignification it ſeems to have gained, by being frequently

quently applied to the boy moſt remarkable for his pranks; as, the *arch* rogue; unleſs it be derived from *Archy*, the name of the jeſter to Charles I.—Eugenio ſet out from the univerſity; he had the reputation of an *arch* lad at ſchool. *Swift.*

(2.) * ARCH, in compoſition, ſignifies chief, or of the firſt claſs, [from ἀρχὸς, or ἀρχὴ.] as, *archangel, archbiſhop.* It is pronounced variouſly with regard to the *ch*, which before a conſonant ſound as in *cheeſe*, as, *archdeacon*; before a vowel like *k*, as *archangel.*

(3.) * ARCH. *n. ſ.* [*arcus*, Lat.] 1. Part of a circle, not more than the half.—The mind perceives, that an *arch* of a circle is leſs than the whole circle, as clearly as it does the idea of a circle. *Locke.*

2. A building open below and cloſed above, ſtanding by the form of its own curve, uſed for bridges and other works.—

Ne'er thro' an *arch* ſo hurried the blown tide,
As the recomforted thro' the gates. *Shakeſp.*

3. The ſky, or vault of heaven.—

Hath nature given them eyes
To ſee this vaulted *arch*, and the rich cope
Of ſea and land? *Shakeſp.*

4. [from ἀρχὸς.] A chief: obſolete.—

The noble duke, my maſter,
My worthy *arch* and patron, comes to-night.
Shakeſp.

(4.) ARCH, in architecture, a concave or hollowed piece of building, conſtructed in ſuch a manner that the ſeveral ſtones of which it is compoſed keep one another in their places. The terms *arch* and *vault* properly differ only in this, that the arch expreſſes a narrower, and the vault a broader, piece of the ſame kind. The principal difference in the form of arches is, that ſome are circular, and others elliptical; the former having a larger or ſmaller part of a circle, the other of an ellipſis. What are called *ſtrait arches*, are thoſe frequently uſed over doors and widows, the upper and under edges of which are ſtrait and parallel, and the ends and joints all pointing toward a centre. The ſpace between two piers of a bridge is called an *arch*, becauſe uſually arched over. Triumphal arches are magnificent entries into cities, erected to adorn a triumph, and perpetuate the memory of the action. The arches of Titus and Conſtantine make at this time a great figure among the ruins of old Rome.

(5.) ARCH, in geometry, any part of the circumference of a circle or curved line, lying from one point to another, by which the quantity of the whole circle or line, or ſome other thing ſought after, may be gathered.

(6.) ARCH OF A CIRCLE is a part of the circumference thereof, leſs than a half, or ſemicircle.

(7.) ARCH OF DIRECTION, in aſtrology, a portion of the equator, lying between two points in the heavens, one of which is the ſignificator, and the other the promiſſor.

(8.) ARCH OF PROGRESSION, in aſtronomy, is an arch of the ecliptic, which a planet ſeems to paſs over, when its motion is according to the order of the ſign.

(9.) ARCH OF RETROGRADATION is an arch of the ecliptic, deſcribed while a planet is retrograde, and moves contrary to the order of the ſigns.

(10.) ARCH OF VISION is the ſun's depth below the horizon, at which a ſtar, before hid in his rays, begins to appear again.

* *To* ARCH. *v. a.* [*arcuo*, Latin.] 1. To build arches.—

The nations of the field and wood.
Build on the wave, or *arch* beneath the ſand. *Pope.*

2. To cover with arches.—

Gates of monarchs
Are *arch'd* ſo high that giants may jet through.
Shakeſp.

3. To form into arches.—Fine devices of *arching* water without ſpilling, and making it riſe in ſeveral forms of feathers and drinking glaſſes, be pretty things to look on, but nothing to health and ſweetneſs. *Bacon.*

ARCHÆOGRAPHIA, the ſcience or ſtudy of antiques, ſo denominated by Spon, comprehending a knowledge of ancient coins, medals, inſcriptions, ſculptures, ſtatues, &c.

ARCHÆOLOGY. See ARCHAIOLOGY.

ARCHÆOTA. See ANTIQUARY, § 3.

ARCHÆUS, or ARCHEUS. See ARCHEUS.

* ARCHAIOLOGY. *n. ſ.* [from ἀρχαῖος, ancient, and λόγος, a diſcourſe.] A diſcourſe on antiquity.

* ARCHAIOLOGICK. *adj.* [from *archaiology.*] Relating to a diſcourſe on antiquity.

(.) * ARCHAISM. *n. ſ.* [ἀρχαϊσμὸς.] An ancient phraſe, or mode of expreſſion.—I ſhall never uſe *archaiſms*, like Milton. *Watts.*

(2.) ARCHAISM, ETYMOLOGIC, is when either an obſolete word, declenſion or conjugation is uſed.

(3.) ARCHAISM, SYNTACTIC, is an unuſual and obſolete conſtruction in diſcourſe.

ARCHAL, in botany, the liverwort of Derbyſhire.

(I. 1.) * ARCHANGEL. *n. ſ.* [*archangelus*, Latin.] One of the higheſt order of angels.—

His form had yet not loſt
All her original brightneſs, nor appear'd
Leſs than *archangel* ruin'd, and th' exceſs
Of glory obſcur'd. *Milton.*

(2.) ARCHANGEL, according to ſome divines, means an angel occupying the eighth rank in the celeſtial hierarchy. See ANGEL, § 7. and HIERARCHY. But others, not without reaſon, reckon it a title only applicable to our Saviour. Compare Jude 9. with Dan. xii. 1.

(II. 1.) * ARCHANGEL. *n. ſ.* [*lamium*, Lat.] The name of a plant called alſo *Dead nettle.*

(2.) ARCHANGEL, BAUM-LEAVED, in botany. See MELITTIS. See alſo LAMIUM.

(3.) ARCHANGEL, YELLOW. See GALEOPSIS.

(III. 1.) ARCHANGEL, in geography, a city of Ruſſia, in the province of Dwina, ſituated on the E. ſide of the river Dwina, about 6 miles from the White Sea, 300 N. of Moſcow, and 400 N. E. from Peterſburgh. The city extends about three miles in length and one in breadth. It is rich, populous, built in the modern taſte, and is a metropolitan ſee. Lon. 39. 0. E. Lat. 64. 34. N.

(2.) ARCHANGEL, HISTORY OF. This city roſe from a caſtle built on the ſpot by Iwan, or John Baſilowitz II. to protect the increaſing trade, brought there, by the diſcovery of the White Sea, by the Engliſh, and took its name from a monaſtery built in honour of the archangel Michael. Before this period the commercial intercourſe be-

tween Ruſſia and the northern parts of Europe had been long carried on by the Hanſeatic towns. The ſhips uſually ſailed to Revel or Narva, and from thence paſſed through Dorpt to Pleſcof and Novogorod, where their factories were eſtabliſhed. The accidental diſcovery of Archangel, in 1553, deprived the Hanſeatic towns of a great part of this lucrative commerce, and transferred it to the Engliſh. On the 11th of May, that year, three ſhips ſailed from Deptford, to explore the northern ſeas, under the command of Sir Hugh Willoughby. Two of theſe veſſels penetrated as high as the 72d degree of latitude, to the coaſt of Spitzbergen; and being afterwards forced by ſtreſs of weather into the bay of the river Arzina in Ruſſian Lapland, both their crews were frozen to death. Richard Chancellor, who commanded the other ſhip, called the Bonaventure, diſcovering the country bordering upon the White Sea, landed near the mouth of the Dwina, in a bay, which he denominated the *Bay of St Nicholas*, from a convent of that name, near the preſent port of Archangel. The czar being informed of his arrival, invited him to his court, entertained him hoſpitably, and indulged the Engliſh with a free trade in his dominions. In conſequence of this permiſſion, a company of merchants was incorporated in London; and being encouraged by particular privileges from the czar, ſet on foot a conſiderable commerce, to the mutual advantage of both nations. This traffic the Engliſh for ſome time enjoyed without competition. The Dutch, however, and other nations, gradually inſinuated themſelves into it, and carried it on at a very great diſadvantage, not being favoured with thoſe privileges which the czar had granted to the Engliſh company. Theſe were at laſt ſuddenly annihilated by Alexis Michaelowitz; who, in 1648, baniſhed the Engliſh merchants from all his dominions. The cauſe of this expulſion was imputed to the reſentment which the czar felt againſt the Engliſh for the execution of Charles I. with whom he was cloſely connected by leagues of amity and alliance: but in fact he aboliſhed the company's privileges the year before that event; and his indignation againſt the Engliſh for their rebellion, was only a political pretext; the real motive being derived from the offers made by the Dutch to pay duties of export and import, to the amount of 15 *per cent.* if they were indulged with the liberty of carrying on as free a trade as the Engliſh throughout his dominions. For not long afterwards, the czar ſuffered William Prideaux, Cromwell's agent, to reſide at Archangel; and permitted the Engliſh to renew their commerce in that port upon the ſame footing with other foreigners. And upon this footing alone our merchants ever after continued to trade. The commodities chiefly imported into Archangel, were gold and ſilver ſtuffs and laces, gold wire, cochineal, indigo, and other drugs for dyeing; wine, brandy, and other diſtilled ſpirits. The cuſtoms ariſing to the czar were computed at 200,000 rubles a-year, and the number of foreign ſhips at 400 annually. But upon the building of Peterſburgh, Peter the Great aboliſhed the immunities of Archangel, and removed the commerce of the White Sea to the havens of the Baltic. Still, however, its exports of tar were conſiderable; in 1730, to the amount of 40,000 laſts, of 11 barrels each. In 1752 Elizabeth again reſtored the ancient immunities of Archangel; and its preſent trade is not inconſiderable. See § 3.

(3.) ARCHANGEL, PRESENT STATE OF. Archangel ſends, during winter, great quantities of the *rawaga*, a ſmall ſpecies of three-finned cod to Peterſburgh frozen. It ſupplies the government of Archangel, part of thoſe of Niſhnei-Novogorod and Caſan, with European commodities; and draws in exchange from thoſe parts corn, flax, hemp, coarſe linen, cordage, ſails, maſts, and tallow, which are moſtly conveyed by the Dwina: it forms alſo a principal communication with the northern and weſtern parts of Siberia, from whence the merchants procure furs, ſkins, and iron. The houſes of Archangel are generally of wood, but well contrived; and every chamber is provided with a ſtove, as a fence againſt the cold, which is here exceſſive in winter. The ſtreets are paved with broken pieces of timber and rubbiſh, diſpoſed ſo unſkilfully, that one cannot walk over it without running the riſk of falling, except when the ſtreets are rendered ſmooth and equal by the ſnow that falls and freezes in the winter. Notwithſtanding the ſeverity of the cold in this place, there is always plenty of good proviſions: butcher's meat, poultry, wild foul, and fiſh, in great variety, and ſold ſurpriſingly cheap. The moſt remarkable edifice in Archangel is a large town-houſe, built of ſquare ſtones in the Italian manner, and divided into three parts. One of theſe conſiſts of large commodious apartments, for the accommodation of merchants, ſtrangers as well as natives: here they are permitted to reſide with their merchandiſe till October, when all the foreign ſhips ſet ſail for the reſpective countries to which they belong. Then the traders are obliged to remove their quarters from the town-houſe or palace, which hath a ſpacious court, that reaches down to the river.

ARCHANGEL-GOROD, a government or province of Ruſſia, in Europe, comprehending part of Lapland, and the ancient kingdom of Holmogard.

* ARCHANGELICK. *adj.* [from *archangel*.] Belonging to archangels.—

He ceas'd, and th' *archangelick* pow'r prepar'd
For ſwift deſcent; with him the cohort bright
Of watchful cherubim *Milton.*

ARCHARD, in commerce, a kind of green fruit, pickled in vinegar, much valued throughout the Eaſt Indies. The beſt are thoſe brought from Perſia, in bottles, much like ſmall cucumbers among us.

* ARCHBEACON. *n. ſ.* [from *arch* and *beacon*.] The chief place of proſpect, or of ſignal.—You ſhall win the top of the Corniſh *archbeacon*: Hainborough, which may for proſpect compare with Rama in Paleſtina. *Carew.*

(1.) * ARCHBISHOP. *n. ſ.* [from *arch* and *biſhop*.] A biſhop of the firſt claſs, who ſuperintends the conduct of other biſhops in his ſuffragans.—

Cranmer is return'd with welcome,
Inſtall'd lord *archbiſhop* of Canterbury. *Shakſp.*

(2.) ARCHBISHOP, ACCOUNT OF THE TITLE AND OFFICE OF. Archbiſhops were not known in the eaſt till about the year 320; and though

there were ſome ſoon after this who had the title, yet that was only a perſonal honour, by which the biſhops of conſiderable cities were diſtinguiſhed. It was not till of late that archbiſhops became metropolitans, and had ſuffrages under them. Athanaſius appears to be the firſt who uſed the title *Archbiſhop*, which he gave occaſionally to his predeceſſor; Gregory Nazianzen, in like manner gave it to Athanaſius; not that either of them were entitled to any juriſdiction, or even any precedence in virtue of it. Among the Latins, Iſidore Hiſpalenſis is the firſt that ſpeaks of archbiſhops. He diſtinguiſhes four orders or degrees in the eccleſiaſtical hierarchy, viz. patriarchs, archbiſhops, metropolitans, and biſhops. The archbiſhop, beſides the inſpection of the biſhops and inferior clergy in the province over which he preſides, exerciſes epiſcopal juriſdiction in his own dioceſe. He is guardian of the ſpiritualities of any vacant ſee in his province, as the king is of the temporalities; and exerciſes eccleſiaſtical juriſdiction in it. He is intitled to preſent by lapſe to all the eccleſiaſtical livings in the diſpoſal of his diocefan biſhop, if not filled within ſix months. He has likewiſe a cuſtomary prerogative, upon conſecrating a biſhop, to name a clerk or chaplain to be provided for by ſuch biſhop; in lieu of which it is now uſual to accept an option. He is ſaid to be *enthroned* when veſted in the archbiſhopric; whereas biſhops are ſaid to be *inſtalled*.

(3.) ARCHBISHOPS, PRVILEGES OF ENGLISH. The eccleſiaſtical government of England is divided into two provinces, viz. Canterbury and York. Canterbury had the following ſuffragan biſhoprics appertaining to it, St Aſaph, Bangor, Bath and Wells, Briſtol, Chicheſter, Litchfield and Coventry, St David's, Ely, Exeter, Glouceſter, Hereford, Landaff, Lincoln, London, Norwich, Oxford, Peterborough, Rocheſter, Saliſbury, Wincheſter, and Worceſter. To York appertain the biſhoprics of Carliſle, Cheſter, and Durham; to which may be added the biſhopric of Soder and Man, whoſe biſhop is not a Lord of Parliament. See CANTERBURY and YORK. The archbiſhop of Canterbury had anciently, viz. till the year 1152, juriſdiction over Ireland as well as England, and was ſtyled a *patriarch*, and ſometimes *alterius orbis papa*, and *orbis Britannici pontifex*. Matters were recorded in his name thus, *Anno pontificatus noſtri primo*, &c. The firſt archbiſhop of Canterbury was Auſtin, appointed by king Ethelbert, on his converſion to Chriſtianity, about the year 598. He was alſo *legatus natus*. He even enjoyed ſome ſpecial marks of loyalty; as, to be patron of a biſhopric, which he was of Rocheſter; and to make knights, coin moneys, &c. He is ſtill the firſt peer of England, and the next to the royal family; having precedence of all dukes and all great officers of the crown. It is his privilege, by cuſtom, to crown the kings and queens of this kingdom. He may retain and qualify eight chaplains, whereas a duke is by ſtatute allowed only ſix. He has, by common law, the power of probate of wills and teſtaments, and granting letters of adminiſtration. He has alſo a power to grant licences and diſpenſations in all caſes formerly ſued for in the court of Rome, and not repugnant to the law of God. He accordingly iſſues ſpecial licences to marry, to hold two livings, &c. and he exerciſes the right of conferring degrees. He alſo holds ſeveral courts of judicature; as, court of arches, court of audience, prerogative court, and court of peculiars. He is addreſſed with the title of *Grace, and moſt Reverend Father in God*; and writes himſelf by *Divine Providence*; whereas biſhops only uſe by *Divine Permiſſion*. The archbiſhop of York has the like rights in his province, as the archbiſhop of Canterbury. He has precedence of all dukes not of the royal blood; and of all officers of ſtate, except the lord high chancellor. He has alſo the rights of a count palatine over Hexamſhire. The firſt archbiſhop of York was Paulinus, appointed by Pope Gregory about the year 622. He had formerly juriſdiction over all the biſhops of Scotland; but in 1470, pope Sextus IV. created the biſhop of St Andrew's, archbiſhop and metropolitan of all Scotland.

(4.) ARCHBISHOPS, SCOTS AND IRISH. Scotland, whilſt epiſcopacy prevailed in that country, had two archbiſhops, of St Andrew's and Glaſgow; of which the former was accounted the metropolitan; and, even before it arrived at the dignity of an archbiſhopric, reſiſted with great ſpirit all the attempts of the archbiſhops of York in England to become the metropolitans of Scotland. The ſees of Argyle, Galloway, and the Iſles, were ſuffragans to Glaſgow; all the others in the kingdom, to St Andrew's. Ireland has four archbiſhops; of Armagh, Dublin, Caſſil, and Tuam; of whom the former is primate of all Ireland.

* ARCHBISHOPRICK. *n. ſ.* [from *archbiſhop*.] The ſtate or juriſdiction of an archbiſhop.—This excellent man, from the time of his promotion to the *archbiſhoprick*, underwent the envy and malice of men who agreed in nothing elſe. *Clarendon*.

ARCH-BUTLER, one of the great officers of the German empire, who preſents the firſt cup to the emperor on ſolemn occaſions. This office belongs to the king of Bohemia. The prince of Limbourg is his vicar.

ARCH-CHAMBERLAIN, an officer of the empire; the ſame with the great chamberlain of England. The elector of Brandenburg was appointed arch-chamberlain of the empire, by the golden bull; and he bears the ſceptre before the emperor, walking on the left hand of the elector of Saxony. At ſome ſolemnities he alſo ſerves on horſeback like other electors, carrying a baſon with a towel in his hands: which, alighting, he ſets for the emperor to waſh.—His vicar is the prince of Hohenzolleren, of the houſe of Brandenburg.

ARCH-CHANCELLOR, a high officer who, in ancient times, preſided over the ſecretaries of the court. Under the two firſt races of the kings of France, when their territories were divided into Germany, Italy, and Arles, there were three arch-chancellors: and hence the three arch-chancellors ſtill ſubſiſting in Germany; the archbiſhop of Mentz being arch-chancellor of Germany, the archbiſhop of Cologn of Italy, and the archbiſhop of Treves, of Arles.

* ARCHCHANTER. *n. ſ.* [from *arch* and *chanter*.] The chief chanter.

ARCH-COUNT, a title formerly given to the

earl of Flanders, on account of his great power and riches.

ARCH-DAPIFER, [from ἀρχὸς, and *dapifer*, ſewer,] the chief ſewer, a principal officer of the Emperor of Germany, whoſe buſineſs it is, upon ſolemn feſtivals, to ſee that the diſhes be properly placed on the imperial table. This office belongs to the Elector of Bavaria, but was formerly claimed by the Count Palatine of the Rhine.

(1.) * ARCHDEACON. *n. ſ.* [*archideaconis*, Lat.] One that ſupplies the biſhop's place and office in ſuch matters as do belong to the epiſcopal function. The law ſtyles him the biſhop's vicar, or vicegerent. *Ayliffe's Parergon.*—Left negligence might foiſt in abuſes, an *archdeacon* was appointed to take an account of their doings. *Carew.*

(2.) ARCHDEACON, OFFICE OF. An archdeacon is next to a biſhop. His juriſdiction extends either over the whole dioceſe or a part of it. He is uſually appointed by the biſhop himſelf; and hath a kind of epiſcopal authority, originally derived from the biſhop, but now independent and diſtinct from his. He therefore viſits the clergy; and has his ſeparate court for puniſhment of offenders by ſpiritual cenſures, and for hearing all other cauſes of eccleſiaſtical cognizance. There are 60 archdeacons in England.

(3.) ARCHDEACON'S COURT, is the loweſt court in the whole eccleſiaſtical polity. It is held, in the archdeacon's abſence, before a judge appointed by himſelf, and called his *official*; and its juriſdiction is ſometimes in concurrence with, ſometimes in excluſion of, the biſhop's court of the dioceſe. From hence, however, by ſtatute 24 Hen. VIII. c. 12. there lies an appeal to the biſhop.

* ARCHDEACONRY. *n. ſ.* [*archidiaconatus*, Lat.] The office or juriſdiction of an archdeacon. —It oweth ſubjection to the metropolitan of Canterbury, and hath one only *archdeaconry*. *Carew.*

* ARCHDEACONSHIP. *n. ſ.* [from *archdeacon.*] The office of an archdeacon.

ARCHDRUID, the chief or pontiff of the ancient druids of a nation. See DRUID.

* ARCHDUCHESS. *n. ſ.* [from *arch* and *ducheſs.*] A title given to the ſiſter or daughter of the archduke of Auſtria, or to the wife of an archduke of Tuſcany.

ARCHDUCHY. See ARCHDUKEDOM.

(1.) * ARCHDUKE. *n. ſ.* [*archidux*, Lat.] A title given to ſome ſovereign princes, as of Auſtria and Tuſcany.—Philip *archduke* of Auſtria, during his voyage from the Netherlands towards Spain, was weather-driven into Weymouth. *Carew's Survey.*

(2.) ARCHDUKE, FARTHER DEFINITION, &c. OF. The word is more accurately defined by Dr Chambers, to be "a duke veſted with ſome quality, pre-eminence, and authority, above other dukes." The archduke of Auſtria is a very ancient title. There have alſo formerly been archdukes of Lorrain and Brabant. Auſtria was erected into a marquiſate by Otho, or Henry I. and into a duchy by Frederic I. in 1156; but we do not well know when, or why, the title *archduchy* was given it.—It is commonly held that Duke Frederic IV. firſt aſſumed the quality: others ſay it was firſt given by the emperor Maximilian I. in 1459, and ample privileges annexed to it.

(3.) ARCHDUKE, PRIVILEGES OF AN. The principal privileges of this ſtate are, that the *archduke* ſhall diſtribute juſtice in his own dominions, without appeal; that he ſhall be judged to have received the inveſtiture of his ſtates, after having demanded it 3 times; and that he cannot be deprived of his countries, even by the emperor, and the ſtates of the empire: that no affair of the empire can be concluded without his participation; and that he have a power of creating counts, barons, and gentlemen, throughout the whole empire; which are privileges to which the other dukes of the empire are entire ſtrangers.

ARCHDUKEDOM, the territory and juriſdiction of an Archduke.

(1.) ARCHE, [ἀρχὴ.] a beginning.

(2.) ARCHE, among phyſicians, the firſt period of a diſeaſe.

* ARCHED. *participal adj.* [from *To arch.*] Bent in the form of an arch.—I ſee how thine eye would emulate the diamond; thou haſt the right *arched* bent of the brow. *Shakeſpeare.*

ARCHED LEGS, an imperfection in a horſe, when, being in his natural poſition, he has his legs bent forwards; ſo that his whole leg makes a kind of arch or bow. This uſually ariſes from exceſſive labour, whereby the back ſinews are made to ſhrink up, ſo that the legs remain *arched*, and naturally tremble after a little riding; though the diſorder is natural to ſome horſes.

ARCHED SKENE, or SCHEME, in architecture, is uſed to denote a flat arch, leſs than a ſemicircular one.

(1.) ARCHELAUS, a celebrated Greek philoſopher, the diſciple of Anaxagoras, flouriſhed about 440 years before Chriſt. He read lectures at Athens, and did not depart much from the opinions of his maſter. He taught that there was a double principle of all things, namely, the *expanſion* and *condenſation* of the air, which he regarded as infinite. Heat, according to him, was in a continual motion. Cold was ever at reſt.—The earth, which was placed in the midſt of the univerſe, had no motion. It originally reſembled a wet marſh, but was afterwards dried up; and its figure, he ſaid, reſembled that of an egg. Animals were produced from the heat of the earth, and even men were formed in the ſame manner. All animals have a ſoul, which was born with them; but the capacities of which vary according to the ſtructure of the organs of the body in which it reſides.—Socrates, the moſt illuſtrious of his diſciples, was his ſucceſſor.

(2.) ARCHELAUS, king of Macedon, was the natural ſon of Perdiccas II. and ſucceeded him after murdering Alcetas, Perdiccas's brother. He greatly ſtrengthened his kingdom, and he was a liberal encourager of literature and the arts. He entertained Euripedes at his court, and employed the pencil of Zeuxis to ornament his palace. He died about A. A. C. 398.

(3.) ARCHELAUS, a ſon of Herod the Great, by Malthace, his 5th wife. He was thought the moſt cruel and bloody of his father's children. Herod having put to death Alexander, Ariſtobolus, and Antipater, and deprived Herod Antipas of his claim to the kingdom, he appointed Archelaus his ſucceſſor, if the emperor agreed to it.

Af

At Herod's death, when this was made known to the people, they ſeemed pleaſed, and promiſed allegiance. Archelaus interred his father with great pomp, made a ſolemn mourning of ſeven days; and gave the people a ſplendid entertainment. Having convened them in the court of the temple, he aſſured them of his mild government; and that he would not aſſume the royal title till he was confirmed by the emperor. Immediately after (A. D. 1.) a tumultuous aſſembly of the people required him to execute the man who had adviſed his father to kill a noted zealot for pulling down the golden eagle from the gate of the temple; at the ſame time demanding that Joazas ſhould be diveſted of the prieſthood, and loading the memory of his father Herod with bitter curſes and reproaches. Provoked at this inſult, he ordered his troops to fall upon them, and 3000 of them were killed on the ſpot. After this he ſet off to Rome, to get himſelf confirmed in the kingdom; but his brother Herod-Antipas oppoſed him, inſiſting on a former will of his father's, conſtituting him his ſucceſſor. In conſequence of which Auguſtus delayed giving an anſwer. The Jewiſh nation petitioned the emperor to ſet aſide the whole family of Herod, and conſtitute them into a Roman province, ſubject to the governor of Syria: Archelaus oppoſed the petition; and the emperor deferred giving judgment. But a few days after he aſſigned Archelaus a part of his father's kingdom, with the title of Ethnarch, and promiſed him the crown if his conduct ſhould merit it. Upon his return to Judea, he depoſed Joazas the high-prieſt; and made Eleazer his brother prieſt in his ſtead. When Archelaus had governed about 7 years in the moſt violent and tyrannical manner, the Jews and Samaritans jointly accuſed him to the emperor, who ſent for him to Rome; and after hearing him, baniſhed him to Vienne in Gaul, where he died. Alſtedius and others ſay he reigned 9 years. To avoid the fury of this monſter, Joſeph and Mary retired to Nazareth.

(4.) ARCHELAUS, the ſon of Apollonius one of the greateſt ſculptors of antiquity, was a native of Ionia, and is thought to have lived in the time of the emperor Claudius. He executed, in marble, the apotheoſis of Homer. This maſterpiece in ſculpture was found in 1568, in a place named *Fratocchia*, belonging to the princes of Colonna, where, it is ſaid, the emperor Claudius had a pleaſure houſe. Father Kircher, Cupert, Spanheim, and ſeveral other learned antiquaries, have given a deſcription and explication of this work.

ARCHEMY, is uſed by ſome to denote the art of tranſmuting leſs perfect metals into the more perfect. In which ſenſe archemy differs from ALCHEMY, as a part from the whole.

ARCHENDA, in the ancient phyſic, a kind of powder prepared of *alcanna* and leaves of the Egyptian liguſtrum, wherewith the people ſmeared their feet after bathing, as a preſervative againſt ſweating and ſtench.

(1.) * ARCHER. *n. ſ.* [*archer*, Fr. from *arcus*, Lat. a bow.] He that ſhoots with a bow; he that carries a bow in battle.—

Draw, *archers*, draw your arrows to the head. *Shakeſp.*

(2.) ARCHERS, a kind of militia or ſoldiery armed with bows and arrows. Archers were much employed in former times: but they are now laid aſide, excepting in Turkey and ſome of the eaſtern countries; where there are companies of archers ſtill ſubſiſting in their armies, and with which they did terrible execution at the battle of Lepanto.—As an exerciſe, the practice of archery is ſtill kept up in many places. See ARCHERS, § 3, 4. In France, under the old monarchy, the officers who attended the lieutenants de police and provoſts to make captures, ſeizures, arreſts, &c. were called *archers*; though their arms were only halberds or carabines.—In this ſenſe they had *archers* of the *grand prevot de l' hotel*; of the *prevot des marchands*; city *archers*; *archers du guet*, or of the watch, &c.—Small parties of archers, called alſo *gens de marechauſſee*, continually patrolled on the great roads, to ſecure them againſt robbers.—The carriages of Lyons, &c. were always eſcorted by a party of archers. To the diligence of theſe archers it was chiefly owing, that perſons travelled in all parts of France in the utmoſt ſecurity; there being fewer robbers on the highway in that whole kingdom in a year, than about London in a week.

(3.) ARCHERS, MODERN SOCIETIES OF. Archery with the long bow continues to be uſed as a manly exerciſe by the inhabitants of Geneva, and in many parts of Flanders; nor is it totally neglected in Great Britain. There are ſeveral ſocieties of archers in England; the chief of which are, the *Woodmen of Arden*, and the *Toxophilite*. But the moſt noted ſociety of this kind, now exiſting is The *Royal Company of Archers* in Scotland. See next ſection.

(4.) ARCHERS, ROYAL COMPANY OF. The ancient records of this company having been deſtroyed by fire about the beginning of the preſent century, no authentic traces of their inſtitution now remain. It is ſaid that they owe their origin to the commiſſioners appointed in the reign of James I. of Scotland, for enforcing and overſeeing the exerciſe of archery in different counties. Thoſe commiſſioners, who were in general men of rank and power, picking out amongſt thoſe under their cogniſance, the moſt expert archers, formed them into a company, and upon perilous occaſions made a preſent of their ſervices to the king as his chief body guards; in which ſituation they often diſtinguiſhed themſelves for their loyalty, their courage, and ſkill in archery. This rank of the king's principal body guards the Royal Company ſtill claim within 7 miles of the metropolis of Scotland. It is certain, that by an act of the privy council of Scotland in 1677, this Company was recogniſed under the name and title of "His Majeſty's Company of Archers:" And by the ſame act a piece of plate of the value of L. 10 Sterling was ordered to be given to be ſhot for by them, at their annual parades called *weapon-ſhawings*, and to be called *The King's Prize*. At this period the Royal Company conſiſted, as it does at preſent, of the principal nobility and gentry of Scotland. But their unfortunate attachment to anti-revolution principles, upon that event's taking place, put almoſt a period

riod to their exiſtence: Their public parades or marches were diſcontinued, and the royal prize was with-held. Upon the acceſſion of Queen Anne, their former ſplendor was revived; and in 1703 they obtained a royal charter, confirming all their former rights and privileges, and conferring others upon them. But their partiality to the family of Stuart was at various after periods the cauſe of a temporary proſperity and decline. Theſe unhappy differences of opinion having totally ſubſided, the Royal Company are now more numerous and flouriſhing than ever, and perhaps even more dexterous archers.. His preſent Majeſty, as a mark of his approbation, has revived the royal prize, which for the firſt time was ſhot for upon the 28th of July 1788 by a numerous and reſpectable meeting. The Woodmen of Arden and the Toxophilite have lately been pleaſed to admit the members of the Royal Company to the freedom of their ſocieties: theſe grants have been followed by reciprocal diplomas from the Royal Company; ſo that the three chief ſocieties of archers in Britain may be ſaid to be now incorporated into one. The prizes belonging to this Company, and which are annually ſhot for, are, 1. A ſilver arrow, given by the town of Muſſelburgh, which appears to have been ſhot for as early as the year 1603. The victor in this, as in the other prizes, except the king's prize, has the cuſtody of it for a year, then returns it with a medal appended, on which are engraved any motto and device which the gainer's fancy dictates. 2. A ſilver arrow given by the town of Peebles A. D. 1626. 3. A ſilver arrow given by the city of Edinburgh A. D. 1709. 4. A ſilver punch-bowl of about the value of L. 50, made of Scottiſh ſilver at the expence of the Company A. D. 1720. And, 5. The king's prize abovementioned, which becomes the abſolute property of the winner. All theſe prizes are ſhot for at what is termed *rovers*, the marks being placed at the diſtance of 185 yards. Beſides theſe, there is another prize annually contended for at butt or point blank diſtance, called the *Gooſe*. The ancient manner of ſhooting for this prize was, a living gooſe was built in a turf butt, having the head only expoſed to view; and the archer who firſt hit the gooſe's head was entitled to the gooſe as his reward. But this cuſtom, on account of its barbarity, has been long ago laid aſide; and in place of the gooſe head, a mark of about an inch diameter is affixed upon each butt, and the archer who firſt hits this mark is captain of the butt ſhooters for a year. The affairs of the Company are managed by a preſes and ſix counſeliors, who are choſen annually by the whole members. The council are veſted with the power of receiving or rejecting candidates for admiſſion, and of appointing the company's officers civil and military. The Company now conſiſts of above 1000 members, among whom are moſt of the Scottiſh nobility of the firſt diſtinction. A number of the Company meet weekly during the ſummer ſeaſon in Edinburgh, in the Meadows, where they exerciſe themſelves in ſhooting at butts: And in the adjoining ground they have a handſome building, erected within theſe 12 years, with ſuitable offices, whither they adjourn after their exerciſe, and where they hold their elections and other meetings relative to the buſineſs of the ſociety. Their uniform is tartan, lined with white, and trimmed with green and white fringes; a white ſaſh, with green taſſels; and a blue bonnet, with a St Andrew's croſs and feathers. The Company have two ſtandards. The firſt of theſe bears on one ſide Mars and Cupid encircled in a wreath of thiſtles; with this motto, "In peace and war." On the other, a yew tree, with two men dreſſed and equipped as archers, enircled as the former; motto, *Dat gloria vires*. The other ſtandard diſplays, on one ſide, a lion rampant gules, on a field, or, encircled with a wreath; on the top, a thiſtle and crown; motto, *Nemo me impune laceſſet*. On the other, St Andrew on the croſs on a field argent; at the top, a crown; motto, *Dulce pro patrica periculum*.

(1.) * ARCHERY. *n. ſ.* (from *archer*.) 1. The uſe of the bow.—Among the Engliſh artillery, *archery* challengeth the pre-eminence, as peculiar to our nation. *Camden*. 2. The act of ſhooting with the bow.—

Flower of this purple dye,
Hit with Cupid's *archery*,
Sink in apple of his eye! *Shakeſp.*

3. The art of an archer.—

Bleſt ſeraphims ſhall leave their quire,
And turn love's ſoldiers upon thee,
To exerciſe their *archery*. *Craſhaw.*

(2.) ARCHERY, FARTHER DEFINITION OF. Archery is rather more accurately defined the art or exerciſe of ſhooting with a bow and arrow. Dr Johnſon, in his definition both of ARCHER, (N° 1.) and ARCHERY, (§ 1.) ſeems to have forgot that the *arrow* was neceſſary to ſhoot with.

(3.) ARCHERY, HISTORY OF. In moſt nations the bow was anciently the principal implement of war, and by the expertneſs of the archers alone was often decided the fate of battles and of empires.—In this iſland archery was greatly encouraged in former times, and many ſtatutes were made for the regulation thereof; whence the Engliſh archers became the beſt in Europe, and obtained many ſignal victories. The *Artillery Company* of London, though they have long diſuſed the weapon, are the remains of the ancient bowmen or archers. Artillery *(artillérie)* is a French term ſignifying *archery*; as the *king's bowyer* was in that language ſtyled *artillier du roy*: And from that nation the Engliſh ſeem to have learnt at leaſt the croſs bow archery. William the Conqueror had a conſiderable number of bowmen in his army at the battle of Haſtings, when no mention is made of ſuch troops on the ſide of Harold: And it is ſuppoſed that theſe Norman archers ſhot with the arbaleſt (or croſs bow,) in which formerly the arrow was placed in a groove, termed in French a *quadrel*, and in Engliſh a *bolt*. Of the time when ſhooting with the long bow firſt began among the Engliſh, there appear no certain accounts. Their chronicles do not mention the uſe of archery, till the death of Richard I. who in 1199, was killed by an arrow at the ſiege of Limoges in Guienne, which Hemmingford mentions to have iſſued from a croſs bow.—After this, there appear no notice of archery for nearly 150 years, when an order was iſſued by Edward III. in the 15th year of his reign, to the ſherives of moſt of the Engliſh counties

counties for providing 500 white bows and 500 bundles of arrows, for the then intended war againſt France. Similar orders are repeated in the following years; with this difference only, that the ſheriff of Glouceſterſhire is directed to furniſh 500 painted bows, as well as the ſame number of white. The famous battle of Creſſy was fought 4 years afterwards, in which our chroniclers ſtate that we had 2000 archers who were oppoſed to about the ſame number of French, together with a circumſtance which ſeems to prove, that by this time we uſed the long bow, whilſt the French archers ſhot with the arbaleſt. Previouſly to the engagement there fell a very heavy rain, which is ſaid to have damaged the bows of the French, or perhaps rather the ſtrings of them. Now the long bow (when unſtrung) may be moſt conveniently covered, ſo as to prevent the rain from injuring it; nor is there almoſt any addition to the weight from ſuch a caſe; whereas the arbaleſt is of a moſt inconvenient form to be ſheltered from the weather. As therefore, in 1342, orders were iſſued to the ſherives of each county to provide 500 bows, with a proper proportion of arrows, it ſeems, probable that theſe were long bows, and not the arbaleſt. At this battle, the Engliſh aſcribed their victory chiefly to the archers.—The battle of Poictiers was fought A. D. 1356, and gained by the ſame means. Sometimes the archers gained great victories without the leaſt aſſiſtance from the men at arms; as, particularly the deciſive victory over the Scots at Hamildon, A. D. 1402. In that bloody battle, the men at arms did not ſtrike a ſtroke, but were mere ſpectators of the valour and victory of the archers. The Earl of Douglas, who commanded the Scotch army in that action, enraged to ſee his men falling thick around him by ſhowers of arrows, and truſting to the goodneſs of his armour (which had been three years in making,) accompanied by about eighty lords, knights, and gentlemen, in complete armour, ruſhed forward, and attacked the Engliſh archers ſword in hand. But he ſoon had reaſon to repent his raſhneſs. The Engliſh arrows were ſo ſharp and ſtrong, and diſcharged with ſo much force, that no armour could repel them. The Earl of Douglas, after receiving five wounds, was made priſoner; and all his brave companions were either killed or taken. Philip de Comines acknowledges, what our own writers aſſert, that the Engliſh archers excelled thoſe of every other nation: and Sir John Forteſcue ſays again and again, "that the might of the realme of England ſtandyth upon archers." The ſuperior dexterity of their archers gave the Engliſh a great advantage over their capital enemies the French and Scots. The French depended chiefly on their men at arms, and the Scots on their pikemen; but the ranks of both were often thinned and thrown into diſorder by flights of arrows before they could reach their enemies. James I. of Scotland, who had ſeen and admired the dexterity of the Engliſh archers, and who was himſelf an excellent archer, endeavoured to revive the exerciſe of archery, among his own ſubjects, by whom it had been too much neglected. With this view, he ridiculed their awkward manner of handling their bows, in his humurous poem of Chriſt's Kirk on the Green; and procured the following law to be made in his firſt parliament, A. D. 1424, immediately after his return to Scotland: "That all men might buſk thame to be archares, fra the be 12 years of age; and that at ilk ten punds worth of land, thair be made bow markes, and ſpecialle near paroche kirks, quhairn upon halie days men may cum, and at the leiſt ſchute thryſe about, and have uſage of archarie: and whaſa uſis not archarie, the laird of the land ſall rais of him a wedder; and giff the laird raiſis not the ſaid pane, the king's ſhiref or his miniſters ſall rais it to the king." But the untimely death of that excellent prince prevented the effectual execution of this law. In 1417, Henry V. aſcribes his victory at Agincourt to the archers, and directs the ſherives of many counties to pluck from every gooſe ſix wing feathers, for the purpoſe of improving arrows, which are to be paid for by the king. In 1421, though the French had been defeated, both at Creſſy, Poictiers, and Agincourt, by the Engliſh archers, yet they ſtill continued the uſe of the croſs bow; for which reaſon, Henry V. as duke of Normandy, confirmed the charters of the baliſtarii, which had been long eſtabliſhed as a fraternity in Rouen. In the 5th of Edward IV. an act paſſed, that every Engliſhman, and Iriſhman dwelling with Engliſhmen, ſhall have an Engliſh bow of his own height, which is directed to be made of yew, wych, hazel, aſh, or auburne, or any other reaſonable tree according to their power. The next chapter alſo directs, that butts ſhall be made in every townſhip, which the inhabitants are obliged to ſhoot up and down every feaſt day, under the penalty of *a halfpenny* when they ſhould omit this exerciſe. In the 14th year of this king, it appears by Rymer's Fœdera, that 1000 archers were to be ſent to the duke of Burgundy, whoſe pay was ſettled at ſixpence a day. This circumſtance proves very ſtrongly, the great eſtimation in which archers were ſtill held. In the ſame year, Edward preparing for a war with France, directs the ſherives to procure bows and arrows, "as moſt ſpecially requiſite and neceſſary." On the war taking place with Scotland, 8 years after this, Edward provided both ordnance and archers; ſo that though the uſe of artillery (as we now term it) was then gaining ground, yet that of the bow and arrow was not neglected. Richard III. by his attention to archery, was able to ſend 1000 bowmen to the duke of Bretagne, and he availed himſelf of the ſame troops at the battle of Boſworth. During the time of Henry VII. there appears no order relative to gunpowder or artillery; but in 1488, he directed a large levy of archers to be ſent to Brittany, and that they ſhall be reviewed before they embark. In the 19th year of his reign, this king forbid the uſe of the croſs bow, becauſe "the long bow had been much uſed in this realm whereby honour and victory had been gotten againſt outward enemies, and the realm greatly defended," &c. In the reign of Henry VIII. ſeveral ſtatutes were made for the promotion of archery. The 8th Eliz. c. 10. regulates the price of bows, and the 13th Eliz. c. 14. enacts, that bow ſtaves ſhall be brought into the realm from the Hanſe towns and the Eaſtward; ſo that archery ſtill continued to

be an object of attention. In Rymer's *Fœdera* there is neither ſtatute nor proclamation of James I. on this head; but it appears by Dr Birch's Life of his ſon (prince Henry,) that at 8 years of age he learned to ſhoot both with the bow and gun, whilſt at the ſame time, this prince had in his eſtabliſhment, an officer, who was ſtyled *bow bearer*. The king granted a ſecond charter to the artillery company, by which the powers they had received from Henry VIII. were conſiderably extended. Charles I. appears, from the dedication of a treatiſe entitled *The Bowman's Glory*, to have been himſelf an archer; and in the 8th year of his reign, he iſſued a commiſſion to the chancellor, lord mayor, and ſeveral of the privy council, to prevent the fields near London being ſo incloſed as "to interrupt the neceſſary and profitable exerciſe of ſhooting," as alſo to lower the mounds where they prevented the view from one mark to another. Catharine of Portugal (queen to Charles II.) ſeems to have been much pleaſed with the ſight, at leaſt, of this exerciſe; for in 1676, by the contributions of Sir Edward Hungerford and others, a ſilver badge for the marſhal of the fraternity was made, weighing 25 ounces, and repreſenting an archer drawing the long bow (in the proper manner) to his ear with the following inſcription: *Reginæ Catharinæ Sagittarii*. The ſupporters are two bowmen, with the arms of England and Portugal. In 1682, there was a moſt magnificent cavalcade and entertainment given by the Finſbury archers, when they beſtowed the titles of "duke of Schorditch," "marquis of Iſlington," &c. upon the moſt deſerving. Charles II. was preſent, but the day being rainy, he was obliged ſoon to leave the field. So lately as 1753, targets were erected in the Finſbury fields, during the Eaſter and Whitſun holidays; when the beſt ſhooter was ſtyled captain for the enſuing year, and the ſecond lieutenant. Though archery continued to be encouraged by the king and legiſlature, for more than two centuries after the firſt knowledge of the effects of gunpowder, yet by the end of the reign of Henry VIII. it ſeems to have been partly conſidered as a paſtime. Arthur, the elder brother of Henry, is ſaid to have been fond of this exerciſe, in ſo much that a good ſhooter was ſtyled *Prince Arthur*. We are alſo informed, that he pitched his tent at Mile End, to be preſent at this recreation, and that Henry his brother attended. When the latter became king, he gave a prize at Windſor, to thoſe who ſhould excel in this exerciſe; and a capital ſhot having been made, Henry ſaid to Barlow, (one of his guards,) "If you ſtill win, you ſhall be duke over all archer's." Barlow therefore having ſucceeded, and living in Shoreditch, was created duke thereof. Upon another occaſion, Henry and the queen were met by 200 archers on Shooter's Hill, which probably took its name from their aſſembling near it to ſhoot at marks. This king likewiſe gave the firſt charter to the artillery company, in the 29th year of his reign, by which they are permitted to wear dreſſes of any colour except purple and ſcarlet, to ſhoot not only at marks but birds, if not pheaſants or herons and within two miles of the royal palaces. They are alſo enjoined by the ſame charter, not to wear furs of a greater price than thoſe of the martin. The moſt material privilege, however, is, that of indemnification from murder, if any perſon paſſing between the ſhooter and the mark is killed, provided the archers have firſt called out *faſt*.—The long bow, however, maintained its place in our armies, long after the invention of fire arms. Nor have there been wanting experienced ſoldiers who were advocates for its continuance, and who in many caſes, even preferred it to the harquebuſs or muſket. King Charles I. twice granted ſpecial commiſſions under the great ſeal, for enforcing the uſe of the long bow. The firſt was in the 4th year of his reign: but this was revoked by proclamation, four years afterwards, on account of divers extortions and abuſes committed under ſanction thereof. The ſecond, anno 1633, in the 9th year of his reign, to William Neade and his ſon, alſo named William, wherein the former is ſtyled an ancient archer, who had preſented to the king, a warlike invention, for uniting the uſe of the pike and bow, ſeen and approved by him and his council of war; wherefore his Majeſty had granted them a commiſſion to teach and exerciſe his loving ſubjects in the ſaid invention, which he particularly recommended the chief officers of his trained bands, to learn and practiſe; and the juſtices and other chief magiſtrates throughout England, are therein enjoined to uſe every means in their power to aſſiſt Neade, his ſon, and all perſons authoriſed by them in the furtherance, propagation, and practice of this uſeful invention. Both the commiſſions and proclamation are printed at large in Rymer. At the breaking out of the civil war, the Earl of Eſſex iſſued a precept, dated in November 1643, for ſtirring up all well affected people by benevolence, towards the raiſing a company of archers for the ſervice of the king and parliament.

(4.) ARCHERY, MODERN ENGLISH, REASONS FOR THE SUCCESS OF. Before the introduction of fire arms, the enemy could only be ſtruck at a diſtance by ſlings, the bow uſed by the ancients, or the croſs bow; to all which the Engliſh long bow was vaſtly ſuperior. As for ſlings, they never have been uſed in the more northern parts of Europe, by armies in the field; nor does their uſe indeed ſeem to have been at all convenient, or extenſively practicable, for two principal reaſons: 1. Slingers cannot advance in a compact body, on account of the ſpace to be occupied by this weapon, in its rotatory motion. 2. The weight of the ſtones to be carried, muſt neceſſarily impede the ſlingers greatly in their movements. The bow of the ancients, again, as repreſented in all their reliefs, was a mere toy compared with that of our anceſtors; it was therefore chiefly uſed by the Parthians, whoſe attacks (like thoſe of the preſent Arabs) were deſultory. The croſs bow is of a moſt inconvenient form for carriage, even with the modern improvements; and, in caſe of rain, could not be eaſily ſecured from the weather.—After the firſt ſhot it could not be ſoon recharged; the bolts were alſo heavy and cumberſome. The Engliſh long bow, on the other hand, together with the quiver of arrows, was eaſily carried by the archer, as eaſily ſecured from rain, and recharged almoſt inſtantaneouſly. It is not therefore extraordinary,

ordinary, that troops, who ſolely uſed this effectual weapon, ſhould generally obtain the victory, even when oppoſed to much more numerous armies. It may be urged, that theſe loſſes having been experienced by our enemies, muſt have induced them to practiſe the ſame mode of warfare. But it is thought that the long bow was not commonly uſed even in England till the time of Edward III. when the victory at Creſſy ſufficiently proclaimed the ſuperiority of that weapon. It required, however, ſo much training before the archer could be expert, that we muſt not be ſurpriſed if ſoon afterwards this military exerciſe was much neglected, as appears by the preambles of ſeveral ancient ſtatutes. Whilſt the military tenures ſubſiſted, the ſovereign could only call upon his tenants during war, who therefore attended with the weapons they had been uſed to, and which required no previous practice. On the other hand, the Engliſh archers were obliged by acts of parliament, even in time of peace, to erect butts in every pariſh, and to ſhoot on every Sunday and holiday, after repairing perhaps to theſe butts from a conſiderable diſtance, whilſt the expence of at leaſt a yew bow is repreſented as being a charge which they were ſcarcely equal to. The king and parliaments of this country having thus compelled the inhabitants to ſuch training, the Engliſh armies had the ſame advantage over their enemies as the excluſive uſe of fire arms would give us at preſent. It appears alſo that the long bow continued to be in eſtimation for more than two centuries after gun powder was introduced, which probably aroſe from muſkets being very cumberſome and unwieldy. Rapid movements are generally deciſive of a campaign; and for ſuch the archers were particularly adapted, becauſe, as they could not be annoyed at the ſame diſtance, they had ſcarcely any occaſion for armour. The flower of ancient armies likewiſe was the cavalry, againſt which the long bow never failed to prevail, as man and horſe were too large objects to be miſſed; and hence the great number of French nobility who were priſoners at Creſſy, Poictiers, and Agincourt; for being diſmounted, if not wounded, whilſt they were clad in heavy armour, they could not make their eſcape. This accounts for the Engliſh obtaining thoſe ſignal victories with inferior numbers; for the nobility and gentry thus becoming priſoners, the other parts of the French army made little or no reſiſtance.—No wonder, therefore, that in England the greateſt anxiety was ſhown to promote the exerciſe of this important weapon, and that ſo many ſtatutes were made for that purpoſe. In Scotland, alſo, little leſs attention, though apparently not with equal ſucceſs, was ſhown to the encouragement of the art. In both kingdoms, it was provided, that the importers of merchandiſe ſhould be obliged, along with their articles of commerce, to import a certain proportion of bows, bow-ſtaves and ſhafts for arrows. Every perſon was enjoined to hold himſelf provided in bows and arrows, and was preſcribed the frequent uſe of archery; and a reſtraint was impoſed upon other ſports, leſt they ſhould interfere with the uſe of the bow; for it was intended, that people ſhould be made expert in the uſe of it as a military weapon, by habituating them to the familiar exerciſe of it as an inſtrument of amuſement. As there was no material difference between the activity and bodily ſtrength of the two people, it might be ſuppoſed that the Engliſh and Scots wielded the bow with no unequal vigour and dexterity; but from undoubted hiſtorical monuments it appears that the former had the ſuperiority; of which one inſtance has been already narrated. (See § 3.) By the regulations, preſcribed in their ſtatute-book for the practice of archery, we find that the Engliſh ſhot very far, thoſe who were arrived at their full growth and maturity being prohibited from ſhooting at any mark that was not diſtant upwards of 220 yards. In uſe of the bow, great dexterity as well as ſtrength ſeem to have been requiſite. Though we hear of arrows at Cheviot Chace which were a yard long, yet is by no means to be ſuppoſed that the whole band made uſe of ſuch, or could draw them to the head. The regulation of the Iriſh ſtatute of Edward IV. viz. that the bow ſhall not exceed the height of the man, is allowed by archers to have been well conſidered; and as the arrow ſhould be half the length of the bow, this would give an arrow of a yard in length to thoſe only who were ſix feet high. A ſtrong man of this ſize in the preſent times cannot eaſily draw above 27 inches if the bow is of a proper ſtrength to do execution at a conſiderable diſtance. At the ſame time it muſt be admitted, that as our anceſtors were obliged by ſome of the old ſtatutes to begin ſhooting with the long bow at the age of ſeven, they might have acquired a greater ſlight in this exerciſe than their deſcendants, though the latter ſhould be allowed to be of equal ſtrength.

(5.) ARCHERY, MODERN METHOD OF PRACTISING. As the ſhooting with the long bow was firſt introduced in England, and practiſed almoſt excluſively for nearly two centuries, ſo it hath occaſioned a peculiar method of drawing the arrow to the ear and not to the breaſt. That this is contrary to the uſage of the ancients is very clear from their reliefs, and from the tradition of the Amazons cutting off one of their paps, as it occaſioned an impediment to their ſhooting. The Finſbury archer is therefore repreſented in this attitude of drawing to the ear, both in the *Bowman's Glory*, and in the ſilver badge given by Catharine to the Artillery Company. Not many years ago, there was a man named Topham, who exhibited ſurpriſing feats of ſtrength, and who happened to be at a public houſe near Iſlington, to which the Finſbury archers reſorted after their exerciſe. Topham conſidered the long bow as a play thing, only fit for a child; upon which one of the archers, wagered a bowl of punch, that he could not draw the arrow two-thirds of its length. Topham accepted this bet with the greateſt confidence of winning; but bringing the arrow to his breaſt inſtead of his ear, he was greatly mortified by paying the wager, after many fruitleſs efforts. As to the diſtance to which an arrow can be ſhot from a long bow with the beſt elevation of 45 degrees that muſt neceſſarily depend much both upon the ſtrength and flight of the archer; but in general the diſtance was reckoned from 11 to 12 ſcore yards. The butts for exerciſe, were directed to be diſtant upwards of 220 yards. There is indeed a tradition,

that an attorney of Wigan in Lancashire, named Leigh, shot a mile in three flights; but the same tradition states, that he placed himself in a very particular attitude, which cannot be used commonly in this exercise. According to Neade, an archer might shoot 6 arrows in the time of charging and discharging one musket. The archers consider an arrow of from 20 to 24 drop weight to be the best for flight or hitting a mark at a considerable distance, and yew is the best material of which they can be made. As to the feathers, that of a goose is preferred; it is also wished, that the feather may drop of itself, from a bird 2 or 3 years old. Two out of three feathers in an arrow are commonly white, being plucked from the gander; but the third is generally brown or grey, being taken from the goose; and, this difference, in point of colour, informs the archer when the arrow is properly placed. From this most distinguished part therefore the whole arrow sometimes receives its name: And this by the by, affords an explanation of the grey goose wing in the ballad of Cheviot chace. Arrows were armed anciently with flint or metal heads, latterly with heads of iron, of these there were various forms and denominations. By an act of the 7th of Henry IV. it was enacted, that all the heads for arrows should be well boiled or brased, and hardened at the points with steel; and that every arrow head should have the mark of the maker: workmen disobeying this order, were to be fined and imprisoned at the king's will and the arrow heads to be forfeited to the crown. Arrows were reckoned by sheaves, a sheaf consisting of 24 arrows. They were carried in a quiver, called also an *arrow case*, which served for the magazine; arrows for immediate use were worn in the girdle. In ancient times phials of quicklime, or other combustible matter, for burning houses or ships, were fixed on the heads of arrows, and shot from long bows. This has been also practised since the use of gun powder. Neade says, he has known by experience, that an archer may shoot an ounce of fire work upon an arrow 12 score yards. Arrows with wild-fire, and arrows for-fire works, are mentioned among the stores at Newhaven and Berwick, in the 1st of Edward VI. The force with which an arrow strikes an object at a moderate distance, may be conceived from the account given by Edward VI. in his journal; wherein he says, that 100 archers of his gaurds shot before him two arrows each and afterwards altogether; and that they shot at an inch board, which some peirced quite through and struck into the other board; divers pierced it quite through with the heads of their arrows, the boards being well seasoned timber; their distance from the mark is not mentioned. To protect our archers from the enemy's horse, they carried long stakes pointed at both ends: these they planted in the earth, sloping before them. In the 1st of Edward VI. 250 of these were in the stores of the town of Berwick, under the article of archer's stakes; there were also at the same time eight bundles of archers stakes in Pontefract castle. To prevent the bow string from striking the left arm, the arm was covered with a piece of smooth leather, fastened on the out side of the arm; this was called a *bracer*; and to guard the finger from being cut by the bow string, archers wore shooting gloves. Chaucer describes all these particulars in his prologue to the Canterbury tales.

(II.) ARCHERY, in our ancient customs, a service of keeping a bow for the use of the lord to defend his castle.

(1.) ARCHES, among navigators, is particularly used for the Archipelago.

(2.) ARCHES, a village in Berkshire.

(1.) * ARCHES-COURT. *n. s.* [from *arches* and *court*.] The chief and most ancient consistory that belongs to the archbishop of Canterbury, for the debating of spiritual causes, so called from Bow-church in London, where it is kept, whose top is raised of stone pillars, built *arch-wise*. The judge of this court is termed the dean of the arches, or official of the *arches-court*; dean of the arches, because with this office is commonly joined a peculiar jurisdiction of thirteen parishes in London, termed a deanery, being exempted from the authority of the bishop of London, and belonging to the archbishop of Canterbury; of which the parish of Bow is one. Some others say, that he was first called dean of the arches, because the official to the archbishop, the dean of the arches, was his substitute in his court, and by that means the names became confounded. The jurisdiction of this judge is ordinary, and extends through the whole province of Canterbury; so that upon any appeal, he forthwith, and without any farther examination of the cause, sends out his citation to the party appealed, and his inhibition to the judge from whom the appeal is made. *Cowel.*

(2.) ARCHES-COURT. To Dr Johnston's description, (§ 1.) it is proper to add, that from this court, there lies an appeal to the king in chancery (that is, to a court of delegates appointed under the king's great seal), by statute 25 Henry VIII. c. 19. as supreme head of the English church, in the place of the bishop of Rome, who formerly exercised that jurisdiction; which circumstance alone will furnish the reason why the Popish clergy were so anxious to separate the spiritual court from the temporal.

ARCHES, DEAN OF THE. } The chief judge
ARCHES, OFFICIAL OF THE. } of the ARCHES COURT. See § 1 and 2.

ARCHESTER, a village of Northumberland, 3 miles from Wellingborough.

* ARCHETYPAL. *ad.* [*archetypus*, Lat.] Original; being a pattern from which copies are made.—

Through contemplation's optics I have seen
Him who is fairer than the sons of men:
The source of good, the light *archetypal*. *Norris.*

(1.) * ARCHETYPE. *n. s.* [*archetypum*, Lat.] The original of which any resemblance is made. —As a man, a tree, are the outward objects of our perception, and the outward *archetypes* or patterns of our ideas; so our sensations of hunger, cold, are also inward *archetypes* or patterns of our ideas. But the notions or pictures of these things, as they are in the mind, are the ideas. *Watts.*

(2.) ARCHETYPE, [from ἀρχὴ and τύπος, a type] in mechanics, the first model of a work, which is copied after to make another like it.—Among printers,

minters it is used for the standard weight by which the others are adjusted.—The archetypal world, among Platonists, means the world as it existed in the idea of God before the visible creation.

ARCH-EUNUCH, the chief of the eunuchs, one of the principal officers in Constantinople, under the Greek emperors.

(1.) * ARCHEUS. *n. s.* [probably from ἀρχὼ.] A word by which Paracelsus seems to have meant a power that prefides over the animal economy, distinct from the rational soul.

(2.) ARCHEUS, [from ἀρχὴ, the principal, chief, or first mover,] a sort of primum mobile, supposed by Van Helmont to superintend the animal economy, and preserve it. It is akin to Plato's *anima mundi*. Neither of these suppositions, nor that of Paracelsus, (§ 1.) appear to have the smallest foundation. Van Helmont carried his idea to a most extravagant height, placing an archeus in the stomach to superintend digestion; and ascribing sympathies, antipathies, diseases, &c. to the archeus being *pleased* or *displeased*!

(3.) ARCHEUS, in chemistry, the highest spirit that can be extracted from mixed bodies.

(4.) ARCHEUS, in medicine, [ἀρχαῖος, ancient,] the ancient practice, concerning which Hippocrates wrote a treatise. Hippocrates also used the words ἀρχαία φύσις, for the former healthy state, before the attack of the disease.

ARCH-FLAMINES, in antiquity, the chief priests among the ancient Romans.

ARCH-HERETIC, a term of reproach among bigots, applied to the advancer or supporter of an opposite opinion in religion, whether right or wrong.

ARCHI, a city in Ephraim, near Bethel.

ARCHIACOLYTHUS, [from ἀρχὸς, chief, and ἀκόλουθος, minister,] the chief of the acolythi, an ancient dignity in cathedral churches; the ministers whereof were divided into 4 orders, viz. priests, deacons, subdeacons, and acolythi; each of which had their chiefs.

ARCHIAS, a poet of Antioch, who wrote a Greek poem on the Cimbrian war.

ARCHIATER, } [from ἀρχὸς, and ἰατρὸς, a
ARCHIATRUS, } physician,] the first physician to a prince who retains several.

ARCHI-DAPIFER. See ARCH-DAPIFER.

* ARCHIDIACONAL. *adj.* [from *archidiaconus*, Lat. an archdeacon.] Belonging to an archdeacon; as, this offence is liable to be censured in an *archidiaconal* visitation.

ARCHIDONA, a town of Spain, in Andalusia.

* ARCHIEPISCOPAL. *adj.* [from *archiepiscopus*, Lat. an archbishop.] Belonging to an archbishop; as, Canterbury is an *archiepiscopal* see; the suffragans are subject to *archiepiscopal* jurisdiction.

ARCHIEROSYNES, [from ἀρχὸς, and ἱερὸς, sacred,] in the Grecian antiquity, a high priest vested with authority over the rest of the priests, and appointed to execute the more sacred mysterious rites of religion.

ARCHIGALLUS, in antiquity, the high priest of Cybele, or the chief of the eunuch priests of that goddess, called *Galli*.

ARCHIGERONTES, [from ἀρχὸς and γέρων, old,] in antiquity, the masters of the companies of artificers at Alexandria. Some have mistaken the archigerontes for the arch-priests appointed to take the confessions of those who were condemned to the mines.

ARCHIGRAPHIA. See ANTIGRAPHIA.

ARCHIGRAPHUS. See ANTIGRAPHUS, N° 3.

ARCHIGUBERNETA, } in antiquity, the
ARCHIGUBERNITES, } commander of the
ARCHIGUBERNUS, } imperial ship, or that which the emperor was aboard of. Some have confounded the office of archigubernus with that of *præfectus classis*, or admiral; but the former was under the command of the latter. Potter takes the proper office of the archiguberneta to have been, to manage the marine affairs, to provide commodious harbours, and order all things relating to the sailing of the fleet, except what related to war.

ARCHI-HERETICAL, highly heretical. See ARCH-HERETIC.

ARCHIL, or } called also ROCHELLA, and OR-
ARCHILLA, } SIELLE, is a whitish moss which grows upon rocks, in the Canary and Cape de Verd islands, and yields a rich purple tincture, fugitive indeed, but extremely beautiful. This weed is imported to us as it is gathered. Those who prepare it for the use of the dyer, grind it betwixt stones so as to thoroughly bruise it, but not to reduce it into powder; and then moisten it occasionally with a strong spirit of urine, or urine itself mixed with quicklime: in a few days it acquires a purplish red, and at length a blue colour. In the first state it is called *Archil*; in the latter, *Lacmus*, or *Litmase*. The dyers rarely employ this drug by itself, on account of its dearness and the perishableness of its beauty. The chief use they make of it is, for giving a bloom to other colours, as pinks, &c. This is effected by passing the dyed cloth or silk through hot water lightly impregnated with the archil. The bloom thus communicated soon decays upon exposure to the air. Mr Hellot informs us, that by the addition of a little solution of tin, this drug gives a durable dye; that its colour is at the same time changed towards a scarlet; and that it is the more permanent in proportion as it recedes the more from its natural colour. Prepared archil very readily gives out its colour to water, to volatile spirits, and to spirit of wine; it is the substance principally made use of for colouring the spirits of thermometers. As exposure to the air destroys its colour upon cloth, the exclusion of the air produces a like effect in these hermetically sealed tubes, the spirits of large thermometers becoming in the compass of a few years colourless. M. l'Abbe Nollet observes, in the French memoirs for 1742, that the colourless spirit, upon breaking the tube, soon resumes its colour, and this for a number of times successively; that a watery tincture of archil, included in the tubes of thermometers, lost its colour in three days; and that, in an open deep vessel, it became colourless at the bottom, while the upper part retained its colour. See COLOUR-MAKING. A solution of archil in water, applied on cold marble, stains it of a beautiful violet, or purplish blue colour, far more durable than the colour which it communicates to other bodies. Mr du Fay says he has seen pieces of marble stained with

ſt, which in two years had ſuffered no ſenſible change. It ſinks deep into the marble, ſometimes above an inch, and at the ſame time ſpreads upon the ſurface, unleſs the edges be bounded by wax, or other like ſubſtances. It ſeems to make the marble ſomewhat more brittle. Linnæus informs us, in the Swediſh Tranſactions for 1742, that the true archil moſs is to be found on the weſtern coaſts of England. It has been for a conſiderable time paſt prepared by Meſſrs Gordons at Leith, from a ſpecies found in the Highlands of Scotland.

ARCHILOCHIAN, a term in poetry, applied to a ſort of verſes, of which Archilochus was the inventor, conſiſting of ſeven feet; the four firſt whereof are ordinary dactyls, though ſometimes ſpondees; the three laſt trochees; *e. g.*

Solvitur acris hyems, grata vice veris & Favoni.

ARCHILOCHUS, a famous Greek poet and muſician, was, according to Herodotus, cotemporary with Candaules and Gyges, kings of Lydia, who flouriſhed about the 14th Olympiad, and A. A. C. 724. But he is placed much later by modern chronologiſts; viz. by Blair in A. A. C. 686, and by Prieſtley in 660. He was born at Paros, one of the Cyclades. His father Teleſicles was in ſo reſpectable a ſtation, that he was choſen by his countrymen to conſult the oracles at Delphos concerning the ſending a colony to Thaſos: but his mother, *Enipo*, was a ſlave, whom Teleſicles, notwithſtanding his high rank, made his wife. Though Archilochus ſhewed an early attachment to poetry and muſic, theſe arts did not prevent his going into the army; but at the firſt engagement at which he was preſent, the young poet, like Horace, and our own Suckling, loſt his buckler, though he ſaved his life by the help of his heels. "It is much eaſier (ſaid he) to get a new *buckler*, than a new *exiſtence*." This pleaſantry, however, did not ſave his reputation; nor could his poetry or prayers prevail upon Lycambes, the father of his miſtreſs, to let him marry his daughter, though ſhe had been long promiſed to him. After theſe mortifications, his life ſeems to have been one continued tiſſue of diſgrace and reſentment; ſo that the *rage of Archilochus* became proverbial; and the provoking this ſatyriſt was compared to the treading upon a ſerpent: A compariſon not too ſevere, if it be true that Lycambes and his three daughters were ſo mortified by his ſatire, as to be driven to the conſolation of a *halter*. In this piece, many adventures are mentioned, full of defamation, and out of the knowledge of the public. There were likewiſe many looſe paſſages in it; and it is ſaid to have been on account of theſe that the Lacedemonians laid a prohibition on his verſes. However, Plutarch ſays there is no bard of antiquity by whom the two arts of poetry and muſic have been ſo much advanced as by Archilochus. To him is attributed particularly the ſudden tranſition from one rhythm to another of a different kind, and the manner of accompanying thoſe irregular meaſures upon the lyre. Heroic poetry, in hexameter verſe, ſeems to have been ſolely in uſe among the more ancient poets and muſicians; and the tranſition from one rhythm to another, which lyric poetry required, was unknown to them; ſo that if Archilochus was the firſt author of this mixture, he might with propriety be ſtiled the *Inventor of Lyric Poetry*, which, after his time, became a ſpecies of verification wholly diſtinct from heroic.—To him is likewiſe aſcribed the invention of *Epodes*. See EPODE. He is alſo generally reckoned among the firſt victors of the Pythic games: and we learn from Pindar, that his muſe was not always a termagant; for though no *mortal* eſcaped her rage, yet ſhe was at times ſufficiently tranquil and pious to dictate hymns in praiſe of the gods and heroes. One in particular, written in honour of Hercules, acquired him the acclamations of all Greece; for he ſung it in full aſſembly at the Olympic games, and had the ſatisfaction of receiving from the judges the crown of victory conſecrated to real merit. This hymn, or ode, was afterwards ſung in honour of every victor at Olympia, who had no poet to celebrate his particular exploits. Archilochus was at laſt ſlain by one Callondax Corax, of the iſland of Naxos; who, though he did it in battle, according to the laws of war, was driven out of the temple of Delphi, by command of the oracle, for having deprived of life a man conſecrated to the muſes. The name of Archilochus and Homer were equally revered and celebrated in Greece, as the two moſt excellent poets which the nation had ever produced. This appears from an epigram in the Anthologia; and from Cicero, who ranks him with poets of the firſt claſs, and in his Epiſtles tells us, that the grammarian Ariſtophanes, the moſt rigid and ſcrupulous critic of his time, uſed to ſay, that the longeſt poem of Archilochus always appeared to him the moſt excellent.

ARCHILUTE. See ARCILEUTO.

ARCHIMAGUS, the high prieſt of the Perſian Magi or worſhippers of fire. He reſided in the higheſt fire-temple, which was had in the ſame veneration with them as the temple of Mecca among the Mahometans. Zoroaſtres firſt fetled it at Balch; but after the Mahometans had overrun Perſia in the 7th century, the Archimagus was forced to remove from thence into Kerman, a province of Perſia, lying on the ſouthern ocean, where it hath continued to this day. Darius Hyſtaſpes took upon himſelf the dignity of Archimagus; for Porphyry tells us, he ordered before his death, that, among the other titles, it ſhould be engraven on his monument, that he had been *Maſter of the Magi*; which plainly implies that he had borne this office among them, for none but the Archimagus was maſter of the whole ſect. From hence it ſeems to have proceeded, that the kings of Perſia were ever after looked on to be of the ſacerdotal tribe, and were always initiated into the ſacred order of the Magi before they took on them the crown, and were inaugurated into the kingdom.

ARCHIMANDRITE, in eccleſiaſtical hiſtory, was a name given by the ancient Chriſtians to what we now call an *abbot*. Father Simon obſerves, that the word *mandrite* is Syriac, and ſignifies a ſolitary monk. But Covarruvias ſays it ſignifies the leader of a flock, and in this ſenſe we find the name ſometimes attributed to archbiſhops. Among the Greeks, by whom it is chiefly uſed, it is always reſtrained to the chief of an abbey.

ARCHIMEDES, a celebrated geometrician, born

born at Syracuſe in the iſland of Sicily, and related to Hiero king of Syracuſe. He was remarkable for his extraordinary application to mathematical ſtudies; in which he uſed to be ſo much engaged, that his ſervants were often obliged to take him from them by force. He had ſuch a ſurpriſing invention in mechanics, that he affirmed to Hiero, if he had another earth whereon to plant his machines, he could move this which we inhabit. He is ſaid to have formed a glaſs ſphere, of a moſt ſurpriſing workmanſhip, wherein the motions of the heavenly bodies were repreſented. He diſcovered the exact quantity of the ſilver which a goldſmith had mixed with the gold in a crown he had made for the king: he had the hint of this diſcovery from his perceiving the water riſe up the ſides of the bath as he went into it, and was filled with ſuch joy, that he ran naked out of the bath, crying Ευρηκα! Ευρηκα! "I have found it! I have found it!" By the invention of machines, he, for a long time, defended Syracuſe on its being beſieged by Marcellus. (See SYRACUSE.) On the city's being taken, that general commanded his ſoldiers to have a particular regard to the ſafety of this truly great man; but his care was ineffectual. "What gave Marcellus the greateſt concern (ſays Plutarch), was the unhappy Archimedes, who was at that time in his muſæum, and his mind, as well as his eyes, ſo fixed and intent upon ſome geometrical figures, that he neither heard the noiſe and hurry of the Romans, nor perceived that the city was taken. In this depth of ſtudy and contemplation, a ſoldier came ſuddenly upon him, and commanded him to follow him to Marcellus; which he refuſing to do till he had finiſhed his problem, the ſoldier, in a rage drew his ſword, and ran him through the body." This happened A. A. C. 208. Cicero, when he was quæſtor in Italy, diſcovered his tomb, on which was carved a cylinder and ſphere. Some of the works of this great mathematician are loſt, but others are preſerved. His pieces which remain are, 1. Two books of the Sphere and Cylinder. 2. The Dimenſions of a Circle. 3. Of Centres of Gravity, or Æquiponderants. 4. Of Spheroids and Conoids. 5. Of ſpiral Lines. 6. The Quadrature of a Parabola. 7. Of the Number of the Sand. 8. Of Bodies that float on Fluids. The beſt edition of theſe is that publiſhed at London, 1675, 4to. Among the works of Archimedes which are loſt, we may reckon the deſcriptions of the following inventions, which we may gather from himſelf and other ancient authors. 1. Περι της στεφανης, or his account of the method which he uſed to diſcover the mixture of gold and ſilver in the crown. 2. His deſcription of the Κοχλιας, or Κοχλιον, an engine to draw water out of places where it is ſtagnated. Athenæus, ſpeaking of the prodigious ſhip built by the order of Hiero, tells us, that Archimedes invented the cochlion, by means of which the hold, notwithſtanding its depth, could be drained by one man. (Διοπτρογραφιον, *lib.* v.) Diodorus Siculus informs us (*lib.* v.) that he contrived this machine to drain Egypt, and that by a wonderful mechaniſm it would empty the water from any depth. 3. The ΕΛΕ, by means of which (according to Athenæus, Λαυνος, *lib.* v.) he launched Hiero's great ſhip. 4. The Τετραστον, of the power of which Tzetzes gives a hyperbolical relation, *Chil* ii. *hiſt.* 35. 5. The machines he uſed in the defence of Syracuſe againſt Marcellus. Of theſe we have an account in Polybius, Livy, and Plutarch. 6. His burning-glaſſes, with which he is ſaid to have ſet fire to the Roman galleys. Galen, Περι κρασεων, *lib.* iii. 7. His pneumatic and hydraulic engines, concerning which he wrote books, according to Tzetzes.

ARCHIMEDES'S BURNING GLASS. See BURNING GLASS.

ARCHIMEDES'S SCREW. See SCREW.

ARCHIMIME, or ARCHIMIMUS, [from αρχη, and μιμος, mimic,] an arch-buffoon, or capital mimic. The archimimes, among the Romans, were perſons who imitated the manners, geſtures, and ſpeech, both of people living, and thoſe who were dead. At firſt they were only employed on the theatre; but were afterwards admitted to their feaſt, and at laſt to their funerals; where they walked after the corpſe, counterfeiting the geſtures and behaviour of the perſon who was carried to the funeral pile.

ARCHINTO, a village of Italy, in the Milaneſe.

(1.) ARCHIPELAGO, in geography, a general term, implying a ſea interrupted by a great number of iſlands. The word is formed by corruption of *Ægeopelagus*, Αιγαιος Πελαγος, the Ægean Sea; a name originally given it by the Greeks; but for what reaſon it is not agreed on. See ÆGEAN SEA. To this ſea, however, the name is now in ſome meaſure appropriated. It is called the *White Sea*, in contradiſtinction to the Euxine, or *Black Sea*; and is that part of the Mediterranean, which lies between Europe and Aſia: having the Morea, Livadia, and Macedonia on the W. Romania on the N. Natolia on the E. and the iſle of Candia on the S. It contains a great number of iſlands; ſuch as Andros, Antiparos, Argentiera, Cerigo, Delos, Lemnos, Milo, Metelin, Naxia, Negropont, Paros, Patmos, Rhodes, Samos, Santorin, Scio, Scyros, Tenedos, Tina, &c. All theſe iſlands lie between the 35th and 40th degrees of N. lat. Some of them are called CYCLADES, becauſe they form as it were a crown and circle round Delos; others are called SPORADES, as being diſperſed without any order, between Aſia and the iſle of Candia.

(2.) ARCHIPELAGO, NORTHERN, extends between the E. coaſt of Kamtchatka, and the W. coaſt of America, and comprehends four cluſters of iſlands: viz. 1. Saſignan, containing 5 iſlands; 2. Khoa, including 8 iſlands; both theſe groups together are called the Aleuthian iſlands: 3. the Andreanoffski Oſtrova, comprifes 16 iſlands; and, 4. the Lyſiie, or Fox iſlands, include alſo 16 iſlands. Modern geographers mention other Archipelagos; ſuch as,

(3.) ARCHIPELAGO OF LAZARUS, near the coaſts of Malabar and Malacca.

(4) ARCHIPELAGO OF MEXICO.

(5.) ARCHIPELAGO OF THE PHILIPPINES, called by ſome the GREAT ARCHIPELAGO, containing the Phillipines, the Moluccas, Celebes, &c.

ARCHIPHERACITÆ, [formed of αρχος, *chief*, and the Hebrew or Chaldee, פרס, *diviſion* or *chapter*,] miniſters in the Jewiſh ſynagogues, appointed

ed to read and interpret the Perakin, or titles and heads of the law, and the prophets. Grotius ſuppoſed them the ſame with the ARCHISYNAGOGUES, but they were rather the chiefs of theſe.

ARCHIPPUS, a noted preacher of the goſpel at Coloſſe.

ARCHIPRESBYTER, or ARCH-PRIEST, a prieſt eſtabliſhed in ſome dioceſes with a ſuperiority over the reſt. He was anciently choſen out of the college of preſbyters at the pleaſure of the biſhop. Theſe archipreſbyters were much of the ſame nature with deans in the cathedral churches, as the college of preſbyters anſwers to the chapter. See PRESBYTER.

ARCHISTRATEGUS, the generaliſſimo, or captain general of an army. See STRATEGUS.

ARCHISYNAGOGUS, the chief of the ſynagogue; the title of an officer among the Jews, who preſided in their ſynagogues and aſſemblies. The number of theſe officers was not fixed, nor the ſame in all places; there being 70 in ſome, and in others only one. They are ſometimes called *princes* or *angels* of the ſynagogue, and had a power of whipping or excommunicating ſuch as deſerved theſe puniſhments.

(1.) * ARCHITECT. *n. ſ.* [*architectus*, Lat.] 1. A profeſſor of the art of building.—The *architect's* glory conſiſts in the deſignment and idea of the work; his ambition ſhould be to make the form triumph over the matter. *Wotton.* 2. A contriver of a building; a builder.—

The haſty multitude
Admiring enter'd, and the work ſome praiſe,
And ſome the *architect*. *Milton.*

3. The contriver or former of any compound body.—This inconvenience the divine *architect* of the body obviated. *Ray on the Creation.* 4. The contriver of any thing.—

An irreligious Moor,
Chief *architect* and plotter of theſe woes. *Shak.*

(2.) ARCHITECT, [from ἀρχὸς, chief, and τέκτων, an artificer, or builder,] a perſon who forms plans and deſigns for edifices, conducts the work, and directs the artificers employed in it. Vitruvius enumerates 12 qualities requiſite to conſtitute a good *architect*; that he be docile and ingenious; well educated; ſkilled in deſigning, in geometry, optics, arithmetic, hiſtory, philoſophy, muſic, medicine, law, and aſtronomy. He ſhould, beſides, have a perfect knowledge of the properties of the materials he uſes, their ſtrength and durability, how to connect them together, ſo as to employ their full ſtrength, or the moſt of it poſſible. Cloſe application to the ſtudy of ancient maſters, and the remaining works of the ancients, together with judgment and taſte to ſelect, and apply the hints which ſuch examples afford, joined to a peculiar genius for ſtudying this art, are neceſſary to render an architect eminent in his profeſſion. The moſt celebrated architects are Vitruvius, Palladio, Scamozzi, Serlio, Vignola, Barbaro, Cataneo, Alberti, Viola, Inigo Jones, De Lorme, Perrault, S. Le Clerc, Sir Chriſtopher Wren, and the Earl of Burlington; to whom we may add Mylne, the Adamſes, and others of our own country.

* ARCHITECTIVE. *adj.* [from *architect*.] That performs the work of architecture.—How could the bodies of many of them, particularly the laſt mentioned, be furniſhed with *architective* materials? *Derham's Phyſico-Theology.*

ARCHITECTOGRAPHIA, the deſcription of ancient buildings, temples, theatres, arches, pyramids, baths, gates, aqueducts, tombs, and the like.

ARCHITECTONICE, [ἀρχιτεκτονικὴ, Gr.] See ARCHITECTURE.

* ARCHITECTONICK. *adj.* [from ἀρχὸς, chief, and τέκτων, an artificer.] That which has the power or ſkill of an architect; that which can build or form any thing.—To ſay that ſome more fine part of either, or all the hypoſtatical principle, is the architect of this elaborate ſtructure, is to give occaſion to demand, what proportion of the tria prima afforded this *architectonick* ſpirit, and what agent made ſo ſkilful and happy a mixture. *Boyle.*

ARCHITECTURE.

INTRODUCTION.

(1.) THE qualifications above mentioned neceſſary for a perfect ARCHITECT, plainly infer the extenſive importance of ARCHITECTURE; but though we inſert Dr Johnſon's definitions of the word and diviſions of the ſcience, we will confine ourſelves at preſent to that diviſion which relates to the conſtruction of buildings neceſſary in civil life; as MILITARY ARCHITECTURE, will be treated of under FORTIFICATION, and NAVAL ARCHITECTURE, under SHIP-BUILDING.

SECT. I. DEFINITIONS, *and* DIVISIONS *of* ARCHITECTURE.

(2.) * ARCHITECTURE. *n. ſ.* [*architectura*, Lat.] 1. The art or ſcience of building. *Architecture*, is divided into *civil architecture*, called by way of eminence *architecture*; *military architecture*, or fortification; and *naval architecture*, which, beſides building of ſhips and veſſels, includes alſo ports, moles, docks, &c. *Chambers.*—

Our fathers next in *architecture* ſkill'd,
Cities for uſe, and forts for ſafety build:
Then palaces and lofty domes aroſe,
Theſe for devotion, and for pleaſure thoſe.
Blackmore.

2. The effect or performance of the ſcience of building.—The formation of the firſt earth being a piece of divine *architecture*, aſcribed to a particular providence. *Burnet's Theory.*

(3.) Although ARCHITECTURE, in its utmoſt latitude, may be defined a mathematical ſcience, containing rules for deſigning and raiſing ALL ſorts of ſtructures, according to geometrical proportion; yet, in its ordinary acceptation, it is applied only

only to the conſtruction of ſuch buildings, as are neceſſary for the purpoſes of CIVIL life, ſuch as houſes, churches, halls, bridges, porticoes, &c.

SECT. II. HISTORY *of* ANCIENT ARCHITECTURE.

(4.) THIS art, we are aſſured, is as old as Cain: for Moſes tells us that he built a city; though what were the materials, or how the buildings were conſtructed, we are entirely ignorant. It is commonly ſaid, that the firſt materials employed in building were twigs of trees, wherewith men conſtructed huts, ſuch as the *wigwams* in uſe among the American Indians at preſent. This, however, appears diſputable. The natural ſhelter afforded by hollows in the ſides of mountains or rocks, it may be ſuppoſed, would much more readily ſuggeſt the idea of uſing ſtones and earth as materials for building houſes. Indeed, conſidering that tents were not invented before the days of Jabel, Tubal-Cain's brother, it is very probable that ſuch temporary houſes as the Indian wigwams were not originally known; otherwiſe the method of covering poles with the ſkins of beaſts, inſtead of ſmall branches or twigs, muſt very ſoon have taken place.

(5.) Theſe temporary houſes ſeem to have come into uſe only when men began to lead an idle wandering life, like the Tartars, and could not be at the trouble of conſtructing durable habitations in every place where they were obliged to wander with their cattle; and Jabel perhaps thus took the hint of making portable houſes or tents. Accordingly we ſee, that no nations, except thoſe who are in a perpetually unſettled ſtate, make uſe of ſuch wretched materials. Even in America, where the human race has appeared in the rudeſt form, they were no ſooner collected into great bodies under the emperors of Mexico and Peru, than ſtone buildings began to be erected. We are not, therefore, to look for the origin of architecture in any ſingle nation; but in every nation, when the inhabitants began to leave off their ſavage way of life, and to become civilized. The origin of regular building hath been deduced from the conſtruction of the meaneſt huts in a very natural and plauſible manner by ſeveral authors.

(6.) "Anciently (ſays Vitruvius) men lived in woods, and inhabited caves; but in time, taking example perhaps from birds, who with great induſtry build their neſts, they made themſelves huts. At firſt they made theſe huts, very probably, of a conic figure; becauſe that is a figure of the ſimpleſt ſtructure; and, like the birds, whom they imitated, compoſed them of branches of trees, ſpreading them wide at the bottom, and joining them in a point at the top; covering the whole with reeds, leaves, and clay, to ſcreen them from tempeſts and rain.

(7.) "But finding the conic figure inconvenient on account of its inclined ſides, they changed both the form and conſtruction of their huts, giving them a cubical figure, and building them in the following manner: Having marked out the ſpace to be occupied by the hut, they fixed in the ground ſeveral upright trunks of trees to form the ſides, filling the intervals between them with branches cloſely interwoven and covered with clay. The ſides being thus completed, four large beams were placed on the upright trunks; which, being well joined at the angles, kept the ſides firm, and likewiſe ſerved to ſupport the covering, or roof of the building, compoſed of many joiſts, on which were laid ſeveral beds of reed, leaves, and clay.

(8.) "Inſenſibly mankind improved in the art of building, and invented methods to make their huts laſting and handſome as well as convenient. They took off the bark, and other unevenneſſes, from the trunks of trees that formed the ſides; raiſed them, probably, above the dirt and humidity, on ſtones; and covered each of them with a flat ſtone or ſlate, to keep off the rain. The ſpaces between the ends of the joiſts were cloſed with clay, wax, or ſome other ſubſtance; and the ends of the joiſts covered with thin boards cut in the manner of triglyphs. The poſition of the roof was likewiſe altered: for being, on account of its flatneſs, unfit to throw off the rains that fell in great abundance during the winter ſeaſon, they raiſed it in the middle; giving it the form of a gable roof, by placing rafters on the joiſts, to ſupport the earth and other materials that compoſed the covering.

(9.) "From this ſimple conſtruction the orders of architecture took their riſe. For when buildings of wood were ſet aſide, and men began to erect ſolid and ſtately edifices of ſtone, they imitated the parts which neceſſity had introduced into the primitive huts; in ſo much that the upright trees, with the ſtones at each end of them, were the origin of columns, baſes, and capitals; and the beams, joiſts, rafters, and ſtrata of materials that formed the covering, gave birth to architraves, friezes, triglyphs, and cornices, with the corona, the mutules, the modillions, and the dentils."—See the repreſentations of primitive huts in *plate* XX. Fig. 1, 2, *and* 3.

(10.) "The firſt buildings were in all likelihood rough and uncouth; as the men of theſe times had neither experience nor tools: but when, by long experience and reaſoning upon it, the artiſts had eſtabliſhed certain rules, had invented many inſtruments, and by great practice had acquired a facility in executing their ideas, they made quick advances towards perfection, and at length diſcovered certain manners of building, which ſucceeding ages have regarded with the higheſt veneration."

(11.) From the earlieſt antiquity the Egyptians have been conſidered as the inventors of arts; and in the time of their proſperity all nations ſought and ſtudied their philoſophy and their ſciences; ſo that being learned in the arts of the Egyptians became proverbial. Among other arts derived from them, architecture is generally enumerated; but this is to be underſtood as meaning only that ſpecies of original architecture, where the ſtrength of the fabric was more regarded than its elegance of ſymmetry. Of this kind are the pyramids; the ruins alſo of a magnificent temple at Luxor, (the ancient Thebes,) of which there remain more than 130 columns, all of conſiderable magnitude, and ſome ſo large as ten feet in diameter, with neat not to ſay elegant ſculpture; beſides ſeveral other remains in the ſame neighbourhood. At Komonbu, and other parts of Egypt, there exiſt

ſtill

ſtill other relics of magnificent works of architecture, as ſhewn by Norden. From theſe wonders which ſtill remain, we can only conjecture what have been deſtroyed.

(12.) It is not, therefore, unreaſonable to conclude, that from Egypt, where the cotemporary nations ſought the arts and ſtudied the ſciences, the Greeks derived their firſt ideas of building, but which were ſo changed and improved by being thus tranſplanted, that it can ſcarcely be known from what ſtock they had their origin. The Greeks, anxious to add elegance to convenience, diſregarded the maſſive and ponderous architecture of the Egyptians; whoſe ignorance of the arch made it abſolutely neceſſary for them to have ſmall ſpaces between their columns, and to burthen their edifices with large and ſtrong architraves.

(13.) This, therefore, may be conſidered as the probable track by which architecture roſe to elegance; for certainly the ſtructures of Egypt are much more ancient than thoſe of Greece; and as it may be conſidered the beſt character of buildings that they provide for the comfort and convenience of man, ſo it muſt be allowed that the Greeks firſt rendered them productive of grace, regularity, and beauty: for, to the fine eye, ſkilful hand, and ſublime genius of that nation is architecture indebted for its rules of harmony, elegance of deſign, and taſte of ornament, which began to arrive at perfection under the foſtering care of Pericles; which period, including the reign of Alexander the Great, muſt be conſidered as its climax of grace, elegance, and beauty, in Greece.

(14.) It is a moſt indubitable fact, that the mind of man is influenced by modes of government: and it is certain that the Greeks, with their independence, loſt alſo their ſuperior vigour of genius; and what remained was, with the ſpoils of their cities, carried to Rome. Hence it is that, from this period, the Romans are to be conſidered as the encouragers and patronizers of architecture. From this period alſo its progreſs was great and rapid, though little was done that could be remarked for its novelty; but the rules of the Greeks were applied to ſtructures ſo numerous, and of ſuch wonderful extent, that we doubt which moſt to admire, the original inventors of theſe ſublime rules, or thoſe who applied them to ſuch ſtupendous buildings.

(15.) Some authors have attempted to prove, that, from the Etruſcans, and not from the Egyptians, the Greeks imbibed their firſt ideas of architecture. The Etruſcans (or Tuſcans) certainly were well ſkilled in building, and from them the Romans in their early ſtate ſought help in all their large works. The remains of the temple of Jupiter Capitolinus, the Cloaca Maxima, &c. the works of Tuſcan artiſts, ſhew them to have well underſtood the ſcience and the practice of uſeful and elegant architecture. Neither when we inſpect the antique vaſes, of undoubted Etruſcan workmanſhip, can we deny them to have poſſeſſed taſte and elegance. But from whatever nation the Greeks firſt acquired their taſte for architecture, it muſt be allowed that they completed the ſcience, by uniting the uſeful and the agreeable in all their deſigns.

(16.) But it is not a little remarkable, that improvements in architecture did not take place in any nation till after, or about the time that Jeruſalem was taken by Nebuchadnezzar. The grandeſt buildings erected among the Aſſyrians ſeem to have owed their exiſtence to this monarch; and it can ſcarce be imagined that he would not endeavour to imitate the architecture of Solomon's temple, to which, by his conqueſt of Jeruſalem, he had full acceſs.—It is alſo remarkable, that the dimenſions of the two pillars, Jachin and Boaz, ſet up by Solomon, very nearly correſpond with thoſe of the Doric order, firſt invented by the Greeks, and which originally came from their colonies ſettled in Aſia Minor. The height of Solomon's pillars, without the chapiter, was 18 cubits; that of the chapiter itſelf was 5 cubits; the circumference was 12 cubits; from whence, according to the Scripture language, we may reckon the diameter to have been exactly 4 cubits—Had they been a ſingle cubit higher, they would have been preciſely of the ſame height with columns of the original Doric order.

(17.) We do not mean poſitively to affirm, that this famous temple gave a model of architecture to the whole world; although it is ſcarce conceivable, but that imitations of it, as far as it could be known, muſt have taken place among many nations. But that no ſuch imitations had reached Greece, and that Grecian architecture was in no great ſtate of improvement, for ſome ages after Solomon, is certain; for Homer, who was cotemporary with Jehoſhaphat, and whom ſome chronologiſts place even ſo low as Hezekiah, gives us no account of any thing like columns of ſtone, in all his writings; but uſes a word, which makes it probable that the columns in his time were nothing better than bare wooden poſts.

(18.) It muſt be allowed, however, that the ancient Egyptian buildings, with all their defects, had an air of vaſt grandeur and magnificence, if we may credit the deſcription given of one of their banqueting rooms by Vitruvius. The uſual ſize of one of theſe rooms was from 100 to 150 feet in length, and its breadth ſomewhat more than half its length. At the upper end, and along the two ſides, they placed rows of pillars tolerably well proportioned to one another, though not of any regular order; and at the lower part they made a magnificent and ſpacious entrance: this with its ornaments, ſeems to have taken up one end of the building entire. We are not told that there were any pillars there; though perhaps they placed two or more toward the angles on each ſide, for uniformity, the central ſpace being enough for an entrance in the grandeſt and moſt auguſt manner. Theſe rows of columns were ſet at a diſtance from the wall, forming a noble portico along the two ſides and upper end of the building. Upon the pillars was laid an architrave; and from this was carried up a continued wall with three quarter columns, anſwering directly to thoſe below, and in proportion one fourth ſmaller in all their parts. Between theſe three quarter columns were placed the windows for enlightening the building. From the tops of the lower pillars to the wall was laid a floor: this covered the portico overhead within, and made on the outſide

outside a platform, which was surrounded by a corrider with rails and ballusters. This was terraced, and served as a plain for people to walk on; and from this they could look through the windows down into the room. To this terrace there was no covering required, as the Egyptians were in no fear of rain. The Egyptians decorated this sort of building with statues; and no kind of ornament could answer it so well, as the light cannot fall upon statues to such advantage in any direction, as when it comes from above, in such a regular, proportioned, and uninterrupted manner.

(19.) Among the ancient Egyptians, Persians, and Babylonians, the vast strength and extent of their buildings seem to have been what they chiefly valued; and in this they certainly as much excelled the Greeks and modern nations, as the latter excel them in the beautiful proportion and elegance of their structure. Some modern authors, however, endeavour to deprive the ancients of what is justly their due, and will have every thing to be exaggerated, which seems beyond the power of modern princes to accomplish. In this way, M. Goguet remarkably distinguishes himself; and that without giving any reason at all. Speaking of the wonder of ancient Babylon, "All these works (says he,) so marvellous in the judgment of antiquity, appear to me to have been extremely exaggerated by the authors who have spoken of them. How can we conceive, in effect, that the walls of Babylon could have been 318 feet high, and 81, in thickness, in a compass of near ten leagues?" To this we may easily reply, that the pyramids of Egypt, and the immense wall which divides China from Tartary, show us, that even such a work as the wall of ancient Babylon is said to have been, is not altogether incredible. The lowest computation of the dimension of the Chinese wall is that it extends in length 1200 miles, is 18 feet high at a medium, and as many thick; according to which computation, it must contain 9,504,000 solid fathoms; and yet if we may credit the Chinese historians, this immense mass of building was finished in five years. If, therefore, we can suppose Nebuchadnezzar, to have been capable of employing as many men for 10 years, as were employed in raising the Chinese wall, (which is not very improbable, considering the vast number of captives he carried to Babylon,) we may suppose him able to have fortified the city of Babylon, as strongly as it is said to have been; for the mass of building is not quite double that of the Chinese wall, though nearly so, amounting to 18,189,600 solid fathoms.

(20.) But M. Goguet argues, that "infinitely more money has been expended, and much more genius required, as well as more power, taste, and time, to finish Versailles, with all its defects, than to construct a pyramid, or erect an obelisk." The genius, taste, and time, we shall not dispute; but as the same author confesses, that 100,000 men were employed for 30 years together, in the construction of the largest pyramid, we think the power may justly be doubted; when we consider what time the above-mentioned number of men would have taken to accomplish some of the works of which M. Goguet boasts so much. The canal of Languedoc, he tells us, extends in length, upwards of 70 leagues, and required the removal of two millions of cubic fathoms of earth. This was no doubt a great work; but had 100,000 men been employed upon it at once, they must have removed the quantity of earth in three weeks, supposing each to have removed only a single fathom a day. Nor can we imagine, that any modern work will stand in competition with the works of the ancients, as to greatness, whatever they may do in other respects.

(21.) To attempt to produce an authority for every species of ornament which belongs to the different orders, would be engaging in a fruitless enquiry. It may not be amiss, however, to bestow a few remarks on such particular parts as may, with some degree of certainty, have their origin pointed out.

(22.) The PLINTH, it is very reasonable to imagine, was, at first, simply a square tile or stone, placed under the trunk of the tree or primitive column, to prevent rotting, to which it was exposed, from the constant moisture of the earth; it also served as a more firm and solid footing to the column. There are instances of several buildings of considerable elegance and extent, which have no plinth to the columns; such as the temple of Erectheus at Athens, the temple of Vesta at Tivoli, and some other places; and in all the Doric temples.

(23.) The TORUS, or swell above the plinth, may have originated from the root or lower part of the tree being thicker than the part above, which also fixed it more firmly on the plinth; or, as by some it is conjectured to have been, only a rope or bandage round the trunk, to prevent its splitting: or, according to Vitruvius, it represents the shoe.

(24.) The idea of the CAPITAL may have originally been suggested by some tree, whose arms spreading, just above where it was necessary the upper parts should be cut off, to be of a proper length, the swell of the arms very likely gave the first idea of the swell of the capital, which was also attended with this advantage; by being broader at the top, it was better formed for receiving the works above.

(25.) The ABACUS was certainly no more than a tile or stone, placed with intent to throw off the water, and prevent its sinking into the column, which would have endangered the duration of the building. The ASTRAGALS and FILLETS were bandages to bind the column. The ARCHITRAVE we may conceive to have been the beams or ties, necessary to unite the columns together. The FRIEZE was a necessary addition when height within was wanted.

(26.) The CORNICE, and its ornaments, were the ends or outer edges of the timbers, rafters, &c. necessary to support the roof. The DENTELS, TRIGLYPHS, MODILLIONS, &c. from the above source also, were accidental hints improved, when to usefulness was wished to be added ornament; and which became permanent, when structures of wood gave place to more elegant and durable ones of stone.

(27.) The ORDERS, among ancient and modern architects, are 5, viz. The *Tuscan*, the *Doric*, the *Ionic*,

Ionic, the *Corinthian* and the *Compoſite*; which are diſtinguiſhed from each other by the column with its baſe and capital, and by the entablature. See plate X.

(28.) The TUSCAN order is characteriſed by its plain and robuſt appearance, and is therefore uſed only in works, where ſtrength and plainneſs are wanted; it has been uſed with great effect and elegance in that durable monument of ancient grandeur, the Trajan column at Rome; indeed, general conſent has eſtabliſhed its proportions for ſuch purpoſes, beyond all others.

(29.) The DORIC poſſeſſes nearly the ſame character for ſtrength, as the Tuſcan; but is enlivened by its peculiar ornaments; the triglyph, mutule, and guttæ or drops, under the triglyph: theſe decorations characterize the Doric order, and in part are inſeparable from it. Its proportions recommend it where united ſtrength and grandeur are wanted.

(30.) The IONIC partakes of more delicacy than either of the former, and therefore, as well as on account of its origin, is called Feminine, and not improperly ſuppoſed to have a matronic appearance. It is a medium between the maſculine Tuſcan and Doric, and the virginian ſlenderneſs of the Corinthian; the boldneſs of the capital, with the beauty of the ſhaft, makes it eligible for porticoes, frontiſpieces, entrances to houſes, &c. Denteles were firſt added to the cornice of this order.

(31.) The CORINTHIAN poſſeſſes more delicacy and ornament, than any other order; the beauty and richneſs of the capital, and the delicacy of the pillar, render it the moſt ſuitable in thoſe edifices, where magnificence and elegance are required. On this account, it is frequently uſed for the internal decoration of large ſtate rooms; in which it has a chaſte appearance, though at the ſame time ſuperb.

(32.) The COMPOSITE or Roman order is the ſame as the Corinthian in its proportions, and nearly alike in ornamental properties. The addition of the modern Ionic volute to the capital, gives a bolder projection. It is applicable in the ſame caſes as the Corinthian.

(33.) The Romans borrowed their architecture from the Greeks, but did not imitate them in the ſtructure of their private dwellings in every particular. Their magnificence, however, in their temples and public buildings, is yet to be ſeen in what remains of them, and which are not only models of all modern architects, but have never been ſurpaſſed, or even equalled, to this day — But though the art of architecture continued almoſt at its higheſt pitch among the Romans for two centuries, it declined exceedingly as the empire began to fail. Tacitus relates, that after the battle of Actium, no men of genius appeared; and after the reign of Alexander Severus, a manner of building, altogether confuſed and irregular was introduced, wherein nothing of the true graces and majeſty of the former was preſerved.

SECT. III. HISTORY *of* MODERN ARCHITECTURE.

(34.) On the decline of architecture among the Romans, and when the empire was entirely overrun by the Goths, the latter naturally introduced their own methods of building. Like the ancient Egyptians, the Goths ſeem to have been more ſtudious to amaze people with the greatneſs of their buildings than to pleaſe the eye with the regularity of their plans, or the propriety of their ornaments. They corrected themſelves, however, a little by the models of the Roman edifices, which they ſaw before them: but theſe models themſelves were faulty; and the Goths being totally deſtitute of genius, neither architecture nor any other art could be improved by them.

(35.) Thoſe ancient buildings in this iſland, which have gone under the indiſcriminate denomination of GOTHIC, our modern antiquaries have, more accurately, divided into SAXON, NORMAN, and SARACENIC, or that ſpecies vulgarly, though improperly, called MODERN GOTHIC.

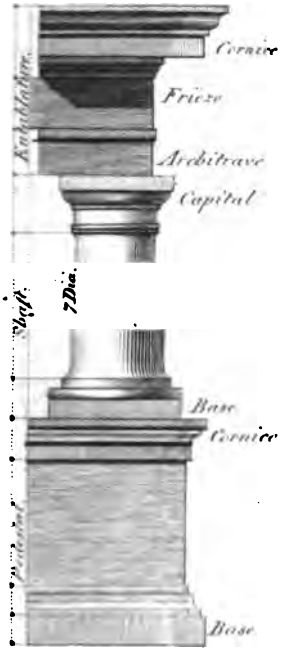
(36.) Some maintain, that the Saxon churches, after they began to be built with ſtone, conſiſted only of upright walls, without piliars or arches, the conſtruction of which, it is alledged, they were entirely ignorant of. But it is highly improbable, that the Saxons could be ignorant of ſo uſeful a contrivance as the arch. Many of them, built by the Romans, they muſt have had before their eyes; and it is not to be believed, that once knowing them and their convenience, they would neglect to uſe, or, having uſed, would relinquiſh them. Beſides, as it appears from undoubted authorities, they procured workmen from the Continent, to conſtruct their capital buildings, "according to the Roman manner," this alone would be ſufficient to confute that ill founded opinion; and at the ſame time prove, that what we commonly call Saxon, is in reality, Roman architecture.

(37.) This ſtyle of building was practiſed all over Europe, and continued to be uſed by the Normans, after their arrival here, till the introduction of what is called the MODERN GOTHIC, which did not happen till about the end of the reign of Henry II. ſo that there ſeems to be little or no ground for a diſtinction between the Saxon and Norman architecture. The ancient parts of moſt of our cathedrals are of this early Norman work, the characteriſtic marks of which are theſe:

(38.) The walls are very thick, generally without butreſſes; the arches, both within and without, as well as thoſe over the doors and windows, ſemicircular, and ſupported by very clumſy columns, with a kind of regular baſe and capital. In ſhort, plainneſs and ſolidity conſtitute the ſtriking features of this method of building. Yet the architects of theſe days ſometimes deviated from this rule. Their capitals were adorned with carvings of foliage, and even animals; their maſſive columns exhibited ſmall half columns united to them, and their ſurfaces ornamented with ſpirals, ſquares, lozenge net-work, and other figures, either engraved or in relievo.

(39.) Various inſtances of theſe may be ſeen in the cathedral of Canterbury, particularly the under croft, the monaſtery of Lindisfarn or Holy Iſland, the cathedral at Durham, and the ruined choir at Orford in Suffolk. The columns, fig. 1, 2, 3, 4, pl. XXI. are at the monaſtery of Lindisfarn or Holy

Tuscan.



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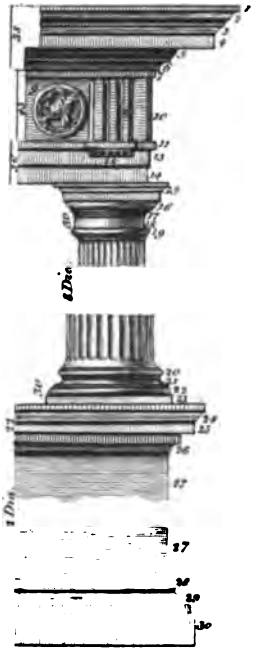
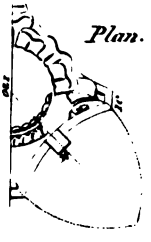


Ionic.

Corinthian.

Angular view of the Corinthian Capital.

Plan.



Ox's Scull
an Ornament in the Doric Order.

Engraved for Encyclopedia Perthensis.

Composite.

Holy Iſland. Thoſe marked fig. 5, 6, 7, are in the ruined chancel at Orford in Suffolk. Fig. 8. is at Chriſt Church, Canterbury. Fig. 9. is a column with two remarkable projections like claws, in the ſouth aiſle of Romſey Church, Hampſhire.

(40.) The Saracenical architecture is diſtinguiſhed by its numerous and prominent buttreſſes, its lofty ſpires and pinnacles, its large and ramified windows, its ornamental niches and canopies, its ſculptured ſaints, the delicate lace-work of its fretted roofs, and the profuſion of ornaments indiſcriminately laviſhed. But its moſt diſtinguiſhing characteriſtics are the ſmall cluſtered pillars and pointed arches, formed by the ſegments of two interſecting circles, (ſee pl. XX.); which arches, though adopted laſt, are of a more ſimple and obvious conſtruction than the ſemicircular ones.

(41.) To what country or people the *modern Gothic*, or the ſtyle of building with pointed arches, which is ſo called, owes its origin, ſeems by no means ſatisfactorily determined. Some have imagined it may have poſſibly taken its riſe from thoſe arcades which we ſee in the early Norman or Saxon buildings or walls, where the wide ſemicircular arches croſs and interſect each other, and form at their interſection a narrow and ſharp pointed arch. But it is more generally conjectured to be of Arabian extraction, and to have been introduced into Europe, by ſome perſons returning from the Cruſades in the Holy Land. Sir C. Wren was of that opinion, and it has been ſubſcribed to by moſt writers who have treated on the ſubject.

(42.) Some plauſible arguments, however, have been adduced, to prove that this ſtyle of architecture was introduced into Spain by the Moors, and from that country paſſed by the way of France into Britain. But according to Mr Groſe, the only corroborating circumſtance, in favour of this opinion, is the Moſque at Cordua in Spain, where, if Mr Swinburn's views are to be truſted, though moſt of the arches are of a ſemicircular or horſe-ſhoe faſhion, there are ſome pointed arches, formed by the interſection of two ſegments of a circle.

(43.) Leaving this point to be decided by antiquarians, we ſhall proceed to deſcribe the progreſs of architecture in ancient Britain. It appears from hiſtory, that before the Roman invaſion, the natives of Britain had no better lodgings than thickets, dens, and caves. Some of the caves, which were their winter habitations, and places of retreat in time of war, were rendered ſecure and warm by art, like thoſe of the ancient Germans, which are thus deſcribed by Tacitus:— "They are uſed to dig deep caves in the ground, and cover them with earth, where they lay up their proviſions, and dwell in winter for the ſake of warmth. Into theſe they retire alſo from their enemies, who plunder the open country, but cannot diſcover theſe ſubterraneous receſſes" Some of the ſubterraneous, or *earth houſes*, as they are called, are ſtill remaining in the weſtern iſles of Scotland, and in Cornwall.

(44.) The ſummer habitations of the moſt ancient Britons were very ſlight; and, like thoſe of the Finnians, conſiſted only of a few ſtakes driven into the ground, interwoven with wattles, and covered over with the boughs of trees.— When Cæſar invaded Britain, the inhabitants of Cantium, (now Kent,) and of ſome other parts in the ſouth, had learned to build houſes a little more ſubſtantial and convenient. They daubed the wattled walls with clay, to fill up the chinks, and make them warmer; and they white-waſhed the clay, after it was dry, with chalk. Inſtead of the boughs of trees, they thatched theſe houſes with ſtraw, as a much better ſecurity againſt the weather. They next formed the walls of large beams of wood, inſtead of ſtakes and wattles. This ſeems to have been the mode of building in Britain, when it was firſt invaded by the Romans. "The Britons (ſays Diodorus Siculus, who was cotemporary with Cæſar) dwell in wretched cottages, which are conſtructed of wood, covered with ſtraw." Theſe wooden houſes were not ſquare but circular, with high tapering roofs, with an aperture at the top, for the admiſſion of light, and the emiſſion of ſmoke.

(45.) At the time of Cæſar's invaſion, our anceſtors had nothing anſwering to our ideas of a city or town, conſiſting of contiguous houſes regular ſtreets, lanes, &c. Their dwellings like thoſe of the ancient Germans, were ſcattered about the country, and generally ſituated on the brink of rivulets, for the ſake of water, and on the ſkirt of ſome wood or foreſt for the convenience of hunting and paſture for cattle. As theſe inviting circumſtances were more conſpicuous in ſome parts of the country than others, the princes and chiefs made choice of ſuch places for their reſidence; and a number of their friends and followers, for various reaſons, built their houſes as near to them as they could with convenience. This produced an ancient Britiſh town, which is deſcribed by Cæſar and Strabo as "a tract of woody country, ſurrounded by a mound and ditch," for the ſecurity of its inhabitants againſt the incurſions of their enemies. "The foreſts, (it is added,) of the Britons are their cities; for when they have incloſed a very large circuit with felled trees, they build within it houſes for themſelves and hovels for their cattle. Theſe buildings are very ſlight, and not deſigned for long duration." The palaces of the Britiſh princes were probably built of the ſame materials, and on the ſame plan, with the houſes of their ſubjects, and differed from them only in ſolidity and magnitude.

(46.) Although the intercourſe between Britain and the continent was more free after the firſt Roman invaſion, than it had been before, and ſome of the Britiſh princes and chieftains even viſited Rome, then in its great glory; it does not appear that the Britons made any conſiderable improvements in their manner of building for at leaſt 100 years after that invaſion. For when the renowned CARACTACUS was carried priſoner to Rome, A. D. 52, and obſerved the beauty and magnificence of the buildings in that proud metropolis of the world, he is ſaid to have expreſſed great ſurpriſe, "that the Romans, who had ſuch magnificent palaces of their own, ſhould envy the wretched cabins of the Britons." But as ſoon as the Romans began to form ſettlements and plant colonies in this iſland, a ſudden and ſurpriſing change enſued in the ſtate of architecture. For

that people, who were as induſtrious as they were brave, quickly adorned every country that they conquered. They not only built a prodigious number of ſolid, convenient, and magnificent ſtructures for their own accommodation, but they exhorted, encouraged, and inſtructed the Britons to imitate their example. Indeed this was one of the arts which Agricola, the moſt excellent of the Roman governors, employed to civilize the Britons, and reconcile them to the Roman government.

(47.) But not very long after this period, architecture and all the arts connected with it began to decline very ſenſibly in Britain, and in all the provinces of the weſtern empire. This was partly owing to the building of Conſtantinople, which drew many of the moſt famous architects and other artificers into the eaſt, and partly to the irruptions and depredations of the barbarous nations. But the final departure of the Romans occaſioned an almoſt total deſtruction of architecture in this iſland. For the people they left behind, having neither ſkill nor courage to defend their numerous towns, forts, and cities, ſuffered them firſt to be plundered, and then deſtroyed, by their ferocious invaders. Thus, the many noble ſtructures, with which Provincial Britain had been adorned by the art and induſtry of the Romans, were ruined or defaced in a very ſhort time; and the unfortunate Britons were equally incapable of repairing them, and of building others in their room. That long ſucceſſion of miſeries in which they were involved by the irruptions of the Scots, Picts, and Saxons, deprived them of the many uſeful arts which they had learned from their former maſters, and lodged them once more in foreſts, dens, and caves, like their ſavage anceſtors.

(48.) The moſt wanton and extenſive devaſtations were thoſe committed by the Anglo-Saxons; among whom it ſeems to have been a maxim, to deſtroy all the towns and caſtles which they took from their enemies, inſtead of preſerving them for their own uſe. It cannot be ſuppoſed, that a people, who wantonly demoliſhed ſo many beautiful and uſeful ſtructures, had any taſte for the arts by which they had been erected. The truth is, that the Anglo-Saxons, at their arrival in this iſland were almoſt totally ignorant of theſe arts; and, like all the other nations of Germany, had been accuſtomed to live in wretched hovels, built of wood or earth, and covered with ſtraw or the branches of trees; nor did they much improve in the knowledge of architecture for 200 years after their arrival.

(49.) During that period, maſonry was quite unknown and unpractiſed in this iſland; and the walls even of cathedral churches were built of wood. The firſt cathedral of York was built of the ſame materials; and a church of ſtone was eſteemed a kind of prodigy in thoſe times, that merited a place in hiſtory. Maſonry was reſtored, and ſome other arts connected with it introduced into England, towards the end of the 7th century, by two clergymen, who were great travellers, and had often viſited Rome, where they had acquired ſome taſte for architecture. Theſe were, the famous Wilfrid biſhop of York, and afterwards of Hexham, and Benedict Biſcop, founder of the abbey of Weremouth.

(50.) WILFRID, who was one of the moſt ingenious, active, and magnificent prelates of the 7th century, was a great builder, and erected ſeveral ſtructures at York, Rippon, and Hexham, which were the admiration of the age in which he flouriſhed. The cathedral of Hexham, which was one of theſe ſtructures, has ſome veſtiges ſtill remaining. It was built by maſons and other artificers brought from Rome by the munificence of its generous founder.

(51.) BENEDICT BISCOP was the cotemporary and companion of Wilfrid in ſome of his journeys, and had the ſame taſte for the arts. He made no fewer than ſix journeys to Rome, chiefly with a view of collecting books, pictures, ſtatues, and other curioſities, and of perſuading artificers of various kinds to come from Italy and France and ſettle in England. But though the art of building edifices of ſtone, with windows of glaſs and other ornaments, was thus introduced by theſe two prelates in the latter part of the 7th century, it does not ſeem to have flouriſhed much for ſeveral centuries after. It appears from many incidental hints in our ancient hiſtorians, that ſtone buildings were ſtill very rare in the eighth and ninth ages; and that when any ſuch buildings were erected, they were the objects of much admiration.

(52.) In the other parts of this iſland architecture was in a ſtill leſs flouriſhing ſtate. After the ancient Britons had retired to the mountains of Wales, in conſequence of the incurſions of the Danes, the ſpirit of architecture ſeems to have been almoſt totally extinct. Such was the poverty of Britain at this period, that a royal reſidence or palace in Wales, with all its offices, was valued at L.5. and 80 pence of the money of that age, equal in quantity of ſilver to L.16 of our money, and in efficacy to L.160! Even the caſtles in Wales, that were built for the ſafety of the country, were conſtructed of the ſame materials with thoſe of which their palaces conſiſted; namely, of wands, with their barks peeled off, wrought in to wicker in the manner of our baſkets! Such were the flimſy materials which formed the ſole walls of edifices deſigned for defence, even againſt the attacks of an enemy, and whence it was that the laws required the king's vaſſals to come to the building of theſe caſtles, with no other tool than an axe.

(53.) The arts of building among the Scots and Picts, at this period, do not ſeem to have undergone much improvement. In the beginning of the 8th century, however, they began to make ſome advances, as appears from ſome edifices yet remaining in Scotland. Theſe buildings are all circular, and ſo extremely various in ſtyle, that they rather ſeem to be works of different ages and nations, than of one age and country. Some of the largeſt of theſe ſtructures are of an extraordinary taſte of architecture, and are deſcribed by Mr Gordon, in his *Itinirarium*, as follows:

(54.) "Having arrived at the barrack of Glenelg, I was conducted to the remains of thoſe ſtupendous fabrics, ſeated about two miles from thence, in a valley called Glenbeg, in which 4 of them anciently ſtood. The firſt I met with is called *Caſtle Chalamine*, or MALCOLM'S CASTLE. It ſtands upon

upon a conſiderable eminence, and affords a fine proſpect of the iſle of Sky and the ſea coaſt. The foundation of this only appears; as alſo of that other, on the E. end of the valley, called CASTLE CHONEL. About a quarter of a mile further, upon the bank of a rivulet which paſſes through the middle of the glen, ſtands that called CASTLE TELLVE. I found it compoſed of ſtones without cement; not laid in regular courſes after the manner of elegant buildings, but rudely and without order. Thoſe toward the baſe were pretty large: but thoſe on the top ſcarcely exceeded the thickneſs of a common brick. I was ſurpriſed to find no windows on the outſide, nor any manner of entrance into the fabrick, except a hole towards the weſt at the baſe, ſo very low and narrow, that I was forced to creep in upon my hands and knees, and found that it carried me down 4 or 5 ſteps below the ſurface of the ground. When I was got within, I was environed betwixt two walls, having a cavity or void ſpace which led me round the whole building. Oppoſite to the little entry on the outſide was a pretty large door in the ſecond or inner wall, which led me into the area or inner court. When I was there, I perceived that one half of the building was fallen down, and thereby had the opportunity of ſeeing a complete ſection thereof. The two walls joined together at the top, round about, and have formed a large void ſpace or area in the middle."

(55.) "But (continues Mr Gordon) to give a more complete idea of theſe buildings, I ſhall deſcribe the fourth, called, CASTLE TRODDAN, which is by far the moſt entire of any of that country, and from whence I had a very clear notion how theſe fabrics were originally contrived. The area of this makes a complete circle; and there are four doors in the inner wall, which face the four cardinal points of the compaſs. Theſe doors are each 8¼ feet high and 5 feet wide, and lead from the area into the cavity between the two walls which run round the whole building. The perpendicular height of this fabric is exactly 33 feet; the thickneſs of both walls, including the cavity between no more than 12 feet; and the cavity itſelf is hardly wide enough for two men to walk abreaſt; the external circumference is 178 feet. The whole height of the fabric is divided into 3 parts or ſtories ſeparated from each other by thin floorings of flat ſtones, which knit the two walls together, and run quite round the building; and there have been winding ſtairs of the ſame flat ſtones aſcending betwixt wall and wall up to the top. Over each door are 9 ſquare windows, in a direct line above each other, for the admiſſion of light; and between every row of windows are 5 others in the uppermoſt ſtorey, riſing above a cornice, which projects out from the inner wall and runs round the fabric."

(56.) From the above deſcription of theſe ſingular edifices it plainly appears, that they were deſigned, both for the purpoſe of defence and lodging; and conſidering the times in which they were erected, they ſeem to have been pretty well calculated for both theſe purpoſes. The ſtone edifices of the other kind, which were probably erected in this period, and of which ſome few are ſtill to be ſeen in Scotland, are not ſo large as the former, but more artificial.

(57.) Theſe are ſlender, lofty, circular towers, of fine ſtone, laid in regular rows between 40 and 50 feet in external circumference, and from 70 to 100 feet high, with one door ſome feet diſtant from the ground. They are exactly ſimilar to the round tower of Ardmore, and ſeveral others, in Ireland. It is therefore probable that they were both built about the ſame time, in the 10th century, and for the ſame purpoſe, which ſome believe was for the confinement of penitents, while they were performing penance. On this account theſe towers are always found in the neighbourhood of churches both in Scotland and Ireland; and are ſaid to have been uſed in this manner: The penitents were placed in the uppermoſt ſtorey of the tower (which commonly conſiſted of five or ſix ſtories); where having made probation, or done penance, ſuch a limited time, according to the heinouſneſs of their crimes, they then were permitted to deſcend to the next floor, and ſo on by degrees, until they came to the door, which always faced the entrance of the church, where they ſtood to receive abſolution from the clergy, and the bleſſings of the people. A tedious proceſs, to which few penitents in the preſent age would willingly ſubmit. Others are of opinion, that the deſign of theſe circular towers (of which one is ſtill remaining at Abernethy and another at Brechin) was to be places from whence the people were called to public worſhip, by the ſound of a horn or trumpet, before the invention of bells.

(58.) Architecture, in the 12th century, received very great improvements, in conſequence of the religious zeal of the clergy, who inſpired all ranks of people with an ardour for pulling down the old churches, and building more elegant and ſplendid ones in their ſtead. In the time of Henry I. all the ancient edifices that had been raiſed in the days of Edgar, Edward, &c. were demoliſhed, and others of greater magnitude and magnificence, and of more elegant workmanſhip erected. A ſimilar ſpirit pervaded Scotland, in proportion to its extent and riches. King David I. alone, beſides ſeveral cathedrals and other churches, built no fewer than 13 abbeys and priories, ſome of them very magnificent.

(59.) The ſacred architecture of the Anglo-Normans in the beginning of this period, did not differ much in its ſtyle and manner from that of the Anglo-Saxons: their churches being in general plain, low, ſtrong, and dark; the arches both of the doors and windows ſemicircular, with few or no ornaments. By degrees, through much practice, our architects, who were all monks or clergymen, improved in their taſte and ſkill, and ventured to form plans of more noble, light, and elevated ſtructures, with a great variety of ornaments; which led to that bold magnificent ſtyle of building, commonly, though perhaps not very properly, called *the* LATER GOTHIC.

(60.) It is not improbable that our monkiſh architects were aſſiſted in attaining this ſtyle of building, by models from foreign countries, or by inſtructions from ſuch of their own number as had

visited Italy, France, Spain, or the East. Its first appearance in England was towards the latter end of the reign of Henry II. But it was not at once thoroughly adopted, some short solid columns and semicircular arches being retained and mixed with the pointed ones. In the reign of Henry III. however, this manner of building seems to have gained a complete footing; the circular giving way to the pointed arches, and the massive columns giving place to the slender pillars: and such was their passion for this new taste, that many of their strong ancient buildings were pulled down, and re-constructed after the model of this new architecture.

(61.) The present cathedral church of Salisbury was begun early in this reign, and finished in 1258. Its style is Saracenic, and according to Sir Christopher Wren, it is one of the finest productions of architecture of the age in which it was built. It is built on one entire plan, and at one time, by which it distinguishes itself from some other cathedrals, which have been built at different periods, and in various styles. From this time till Henry VIII. the fashionable pillars in churches were of Purbeck marble, very slender and round, encompassed with marble shafts a little detached, having each a capital adorned with foliage, which joining, formed one elegant capital for the whole pillar. The windows were long and narrow, with pointed arches and painted glass. In this century, lofty steeples, spires, and pinnacles, were much the taste in building churches.

(62.) In the 14th century, pillars consisted chiefly in an assemblage of shafts not detached, but united, forming one solid and elegant column. Their windows, especially those of the east and west ends were large, and divided by stone mullions running into ramifications above, and forming numerous compartments in various fanciful shapes. Those windows were filled with stained glass of the most lively colours, on which were represented kings, saints, and martyrs, and their histories. Yet, notwithstanding the perfection to which architecture had attained in these instances, this art, as applied to common dwelling-houses, did not receive a proportionate degree of improvement, if any at all: for even in the city of London, towards the end of the 12th century, the houses of mechanics and common burgesses were built of wood and covered with straw or reeds. That numerous and useful body of men were in fact in a state of great depression in those times, when the arts of popery were practised to render them the servile instruments of the priesthood; and consequently little attention was paid to the convenience, much less to the elegance of their dwellings.

(63.) Towards the close of the reign of Henry VII. a new kind of low pointed arch was much in use. It was described from four centres, (see *Plate* XX,) was very round at the haunches, and the angle at the top was very obtuse. This sort of arch is to be found in all cardinal Wolsey's buildings; also at West Sheen; an ancient brick gate at Mile End, called *King John's Gate*; and in the great gate of the palace of Lambeth.

(64.) From this period Gothic architecture began to decline; and was soon after supplanted by a MIXED STYLE, if one may venture to call it so; wherein the Grecian and Gothic, however discordant and irreconcileable, were jumbled together. Concerning this mode of building, Mr Warton remarks, that "Although the Roman or Grecian architecture did not begin to prevail in England till the time of INIGO JONES, yet our communication with the Italians, and our imitation of their manners, produced some specimens of that style much earlier. Perhaps the earliest was Somerset House in the Strand, built about the year 154[illegible] by the duke of Somerset, uncle to Edward VI. In 1613, the magnificent portico of the schools at Oxford was erected, in which, along with the Gothic style, the architect has affectedly displayed his extraordinary skill in the Grecian and Roman architecture; and has introduced all the five orders together.

(65.) In the 15th and 16th centuries, when learning of all kinds began to revive, the ancient architecture of the Greeks and Romans seemed, as it were, to be recalled into life. The first imitations of it began in Italy, and even owed their existence to the many ruins of the ancient Roman structures that were to be found in that country, from whence an improved method of building was gradually brought into the other countries of Europe: and though the Italians for a long time retained the superiority, as architects over the other European nations, yet as men of genius from all quarters constantly visited Italy for the purpose of improvement in architecture as well as the other arts, since that period they have been equalled, if not surpassed, by architects of other nations, and even of our own country this we had a recent instance in our countryman Mr MYLNE, who gained the prize in architecture at Rome, where, we need not doubt, he had the best Italian artists of the age to compete with.

PART I.

GENERAL PRINCIPLES OF ARCHITECTURE.

SECT. I. *Of* COMPOSITION *and* HARMONY IN BUILDING.

(66.) THE original intention of architecture being protection from the inclemency of the weather, and this being easily attained by the coarse materials, carelessly compiled for a considerable period must doubtless have been before other objects were thought of, as proper necessary to be conjoined with it. The devastations of winds and rains, however, would soon teach the necessity of strength and solidity; the failures of repeated attempts to guard against them, would show that proportion and symmetry of order were absolutely necessary; and the diluvian ages in all probability would produce beauty, regularity, harmony, and grandeur superadded to convenience and utility; and consequently before architecture came to be ranked as a fine art.

(67.) The experience of mankind, has long taught us, that architecture, [illegible] chiefly valuable on account of its [illegible] able, as well as other arts and sciences,

formed appearance. Nothing can be more disagreeable, than to see a profusion and glare of light in one part of a room, whilst the other is under a strong shade; such contrary effects always prove disadvantageous to the appearance of furniture and other ornaments common to good apartments. Steps of stairs should likewise receive a suitable proportion, and be accommodated to the human figure, without relation to the magnitude of any other part of the building; and therefore in small and large houses they are alike in size, because men are nearly alike in stature.

(75.) The proportion of rooms are either intrinsic or relative, though in most cases both are included. The intrinsic proportion of a room is its length, breadth, and height; which being properly adjusted, we pronounce it of a beautiful proportion, without regard to any other part of the building. But the relative beauty of proportion is as the whole area of the room is, to the magnitude of the house of which it composes a part. A room may be well proportioned as to itself, but may, at the same time, be either too large or too small for the whole edifice. In a sumptuous building, the capital rooms ought to be large, otherwise they will not be proportioned to the size of the whole; and for the same reason a very large room is improper in a small house; yet every house ought to have both large and small rooms, in proportion to itself. But in things thus related, the mind requires not a precise or single proportion, rejecting all others; on the contrary, different proportions are sometimes equally agreeable to contemplate. It is only when a proportion becomes loose and distant, that the agreeableness abates and at last vanishes.

(76.) With regard to the proportion the height of a room should bear to the length and breadth, it must be rather uncertain in some cases, arising from that deception to which the eye is subject, when its height exceeds 16 or 17 feet; yet if a proper optical allowance be made, we do not think the attainment of a beautiful proportion, so hazardous or arbitrary a task, as some architects would insinuate. A room 48 feet in length, and 24 in breadth and height, is well proportioned; but it is well known, that were we to reduce those to 12 and 24, a room would approach too near the appearance of a gallery. Yet it is evident, that, if the proportion be so adjusted as to be in the medium between these two, a room cannot produce a bad effect as to its size. For instance, if the height and breadth be 18 feet each, and the length 36 feet, this proportion of a room is by architects termed *harmonic*, or agreeable to the eye, answering to *diapente*, one of the chords in music, which includes the interval from 1 to 5, and is agreeable to the ear.

(77.) Upon this principle there are 7 proportions assigned to rooms, which are termed *harmonics* or agreeables. The cube, cube and half, double cube, the subduple or 4, 3, and 2—ditto of 5, 4, and 3—ditto of 6, 4, and 3—and lastly, of 3, 2, and 1. Upon this scale, if the height of the room be 18 feet, as before, it is of the cube form when its width and length are the same, or more properly when the floor, ceiling, and side-walls are all of one dimension. The 2d, or cube and half proportion, will be 27 feet long, and 18 broad: the 3d, or double cube proportion, 36 feet by 18 broad; the subdupule of 4, 3, and 2, produces 36 feet in length, and 27 in breadth; ditto of 5, 4, and 3, produces 30 feet by 24 broad; ditto of 6, 4, and 3, produces 36 by 24 broad; ditto of 3, 2, and 1, produces 54 by 36 broad.

(78.) To find the produce of these subduples proceed thus: In every case divide the given height of the room by the smallest numbers, 3, 2, or 1, as may be required. Again, multiply the quotient by the middle numbers 4, 3, or 2, and the produce will be the width of the room. Lastly, multiply the said quotient by the largest numbers 4, 5, 6, or 3, and the produce will give the length of the room of the 1st sub-duplicate, 4, 3, and 2.

EXAMPLE.

Divisor.	Dividend.	Quotient.
2)	18 (	9
		3 middle number

multiplied quotient 9 mult. by — the large number 4 — 27 ft. width of the room.

36 ft. length of the room.

(79.) If we propose 12 feet for the height of a room, proceed as above. Yet it should be observed, that the double cube proportion of a room upon this scale would be 12 feet in height and width, and 24 in length, which, though admitted by a certain architect amongst the number of the harmonic proportions for rooms, yet it is condemned by him as approaching to the form of a gallery; which is certainly a self-contradiction, and tends to unsettle and render undetermined the very doctrine he advances. On the other hand, the cube form, though admitted into the number of harmonic proportions, would as often be pronounced by the judgment of sight too broad. This however is to be understood only when a room is of large dimensions; for, when small, it is quite agreeable and convenient.

(80.) It is evident, then, that the double and single cube are two extreme proportions for rooms, and that each of them requires a certain scale of magnitude to render them beautiful and useful; the former being applicable to a large room, the latter to a small one. It is also evident, that the doctrine of harmonic proportions of rooms is not quite perfect, otherwise there could be no exceptions taken in any case. It is not so in the proportion of sounds; every chord is alike pleasing upon any scale; and though some of the chords are less perfect than others, yet all of them produce harmony to every ear capable of the least sensation of music. We therefore conclude, that though there exists a considerable agreement between the doctrine of sounds and the dimensions of a room, yet they are not strictly analogous; consequently the judicious architect will make his own exceptions. There is indeed no exact balance between the objects of different senses. What pleases the ear in harmony is not the proportion of the strings of the instrument, but the sounds which these strings produce. In architecture, on the contrary, it is the proportion

ferent quantities that pleaſes the eye, without the the leaſt relation to ſound.

(81.) With regard to the FIGURE of rooms little need be ſaid, as it is ſelf-evident that thoſe of four ſides with right angles, are beſt adapted for the reception of light and the diſtribution of furniture. Thoſe, however, of the circular or regular polygonal kind are preferable, when the light comes in by an aperture in the roof or ceiling.

SECT. III. *Of the* EXTERNAL PROPORTIONS *of* HOUSES.

(82.) An ingenious author on this ſubject has the following remark: "To ſee, on a conſiderable eminence, the length of a front trifling, and the height diſproportioned, would be as abſurd as to behold a front in a vale long and extended, and elevated only one ſtorey. Proportion (ſays he) requires our niceſt choice, which muſt be dependent upon rules; for as the jarring of inſtruments by blind chance cannot poſſibly pleaſe the ear, ſo the diſproportion of the parts of any object muſt naturally ſhock the eye; and in both, unerring rules muſt ſo proportion the ſounds, and diſpoſe the parts as the whole may be in complete harmony. Nature has taught manki d, in muſic, certain rules for proportion of ſounds; ſo architecture has its rules dependent on thoſe proportions, or at leaſt ſuch proportions as are in arithmetical harmony; and thoſe we take to be dependent on nature. The ſquare in geometry, the uniſon or circle in muſic, and the cube in building, have all an inſeparable proportion, the parts being equal, and the ſides and angles, &c. give the eye and ear harmonic pleaſure."

(83.) Yet even this theory, when applied to the whole fabric, gives way to exceptions; for the cube muſt not exceed 50 feet; the cube and half 60 feet; and the double cube 80 feet front. The general rule is as follows: If the cube be 50 feet front, the depth and height will be the ſame. The cube and half is when the front is 60 feet long; the depth and height each 40 feet. The double cube of 60 feet will be 30 feet deep and 30 feet high. In the country where gentlemen's houſes are detached, and are eaſily viewed in front and depth by an approaching traveller, a ſtrict regard to proportion becomes neceſſary; for if the cube form be adopted in very large houſes, it will appear uncouth and heavy; whilſt, on the other hand, it is equally diſagreeable to ſee a dwelling houſe approach to the appearance of a lofty tower.

(84.) Very high dwelling houſes prove exceedingly inconvenient; and therefore, where beauty of proportion is connected with utility, they ought rather to aſſume the figure of a parallelopipedon reſting on its larger baſe. Hence that form of building which rather ſpreads upon the ground than riſes in height, is always preferred. In towns the houſes being generally attached to each other, they unitedly compoſe a regular ſtreet or ſquare; in which caſe the proportions of an individual front are leſs obvious and their depth in this reſpect immaterial. The great object of concern is the uniformity of the whole, when completed; or of one individual houſe with the whole. In theſe ſituations, the proportions of houſes, and the length and extent of ſtreets, are rather ſubject to acts of parliament than to architectural laws.

(85.) There are four different rates into which the proportions of houſes in town are divided or claſſed by the legiſlature. The firſt rate or houſes of the largeſt ſize, are ſuch as exceed nine ſquares of buildings; thoſe of the ſecond rate are from 5 to 9 ſquares; thoſe of the 3d from three and a half to 5 ſquares; and of the 4th not exceeding 3 ſquares and an half. Their height is regulated in like manner, and the thickneſs of their walls and chimneys. Under ſuch reſtrictions the architect muſt often proceed under great diſadvantages, and muſt occaſionally call forth the good quality of docility recommended by Vitruvius.

SECT. IV. *Of the* SITUATION *and* INTERNAL DIVISION *of* HOUSES.

(86.) A proper ſituation for building, where a choice can be had, is highly worthy of the attention of an architect. It muſt be obvious that a riſing ground is much better ſuited for a magnificent palace than a concealed valley; and that it would be incongruous and abſurd to erect a ſumptuous building on a wild, uncultivated, and barren ground, deſtitute of water, woods, hills, or other natural beauties, which nature has aſſigned to various and even extenſive portions of the earth. Where ſuch ſituations are left to the choice of the architect, it becomes him to apply his taſte in fixing the preciſe ſituation or bearings of his intended work, in the execution of which he muſt attend to the four cardinal points.

(87.) In the firſt place he muſt obſerve, that every internal diviſion or room may receive a due degree of light and heat, ſuited to its intended uſe, and the different ſeaſons in which it is more particularly to be occupied. Here the ſkilful architect muſt exerciſe ſeveral of thoſe qualifications enumerated by Vitruvius, as eſſentially requiſite to the formation of his character. And indeed whatever qualifications are abſolutely neceſſary in the proper choice of the ſituation and plan of a town or city, the ſame will be wanted to complete a country reſidence.

(88.) The chief objects of human concern being health, pleaſure, and convenience, whatever contribute to theſe muſt be ſtudied with attention. Hence the neceſſity of a ſituation beſt adapted for good air, a ſufficient ſupply of wholeſome water at a convenient diſtance for a family uſe and fertile grounds, whoſe produce in ſummer may render ſalubrious the element in which we breathe. For the ſame reaſons, marſhy, low, and barren lands, (where even brutes will ſcarcely thrive) and more eſpecially ſtagnant waters ſhould be avoided.

(89.) One infallible mark of a good ſituation for health, is thriving cattle and healthy inhabitants. In fixing on the preciſe ſpot of ground, that which is moderately elevated, if it be contiguous to ſome river, will be beſt adapted for health, pleaſure, and convenience. In ſuch a ſituation, the air has a conſtant motion and free circulation, by which it purifies itſelf. . water does by a current, and becomes more ſalutary to the human frame. And nothing can ſo much contribute to the excellence of a proſpect as a river,

eſpecially a winding one; the beauty of which will, in idea, be heightened by its utility as the means of ſupplying water.

(90.) Theſe eſſential preliminaries being ſettled, the architect proceeds to conſider in what direction his front and flank are to be placed with reſpect to the ſouth or north points. This, in many inſtances, will be cloſely connected with the internal diviſion of the houſe, which aſſigns to each room its particular uſe and ſeaſon. Cool drawing-rooms are ſuitable for ſummer; and for this purpoſe they ſhould be large, and ſituated toward the north, ſo as to be ſcreened from the ſcorching beams of the ſun. Warm drawing-rooms are adapted for winter; and therefore theſe ſhould be ſmall, and have a place towards the ſouth, or where the reviving rays of the ſun have free intercourſe. Rooms appropriated for ſpring and autumn may be in a medium ſituation to theſe, and ſhould have their windows to look into the different gardens or green walks. Libraries, ſtudies and morning rooms, ſhould have the ſame ſort of proſpect, as being moſt conformable to morning exerciſes. If the houſe be built on ſo large and magnificent a ſcale, as to admit the ſame variety in all the different apartments, the dining parlours, bed-rooms, &c. will be ſubject to the ſame laws of ſituation, and anſwerable to the different ſeaſons of the year.

(91.) It has been doubted whether the principal rooms ſhould lie neareſt the grand entrance, as being beſt ſuited to give them their full effect. The following reaſons have been urged for the negative. A large and ſpacious room, which is generally the firſt that receives us, is a bad contrivance in ſeveral reſpects. 1. When, immediately from the open air, we ſtep into ſuch a room, its ſize is apparently diminiſhed by contraſt; and looks little compared with the great canopy of the ſky. 2. When it recovers its grandeur, as it ſoon does, it gives a diminutive appearance to the reſt of the houſe; paſſing from it, every apartment looks little. 3. By its ſituation it ſerves only for a waiting room, and a paſſage to the principal apartments. Rejecting therefore this form, a hint may be taken, from the *climax* in writing, for another that appears more ſuitable: a handſome portico, proportioned to the ſize and faſhion of the front, leads into a waiting room of a larger ſize, and this to the great room, all by a progreſſion of from ſmall to great.

(92.) The different offices ſhould be ſo arranged as to appear to compoſe an inferior part of the whole building, not totally detached, yet in ſuch order as to keep the more offenſive ones as remote as poſſible from the principal parts of the houſe. This indeed is the arrangement of nature; for if we compare the ſeveral parts of a building to the various members which compoſe an animal frame, we ſee that the moſt beautiful parts are the moſt conſpicuous, whilſt thoſe that are leſs comely are concealed.

Sect. V. *Of the* various Ornaments, *which contribute to give a* peculiar Expreſſion, *or an* apparent Uſefulness *to* Buildings.

(93.) Some writers on architecture have doubted whether a building can admit of any ornaments but ſuch as are uſeful, or at leaſt have the appearance of being ſo. But conſidering architecture no leſs as a fine than an uſeful art, both kinds may be properly introduced. A private houſe, and other edifices, where uſe is the chief aim, admit not indeed of any ornaments but ſuch as have the appearance of utility. But temples, triumphal arches, and ſuch buildings as are chiefly intended for ſhow, may be highly ornamented without any regard to their ſeeming uſefulneſs. Hence a threefold diviſion of ornaments has been ſuggeſted, viz.

(94.) 1ſt, Ornaments that are beautiful without relation to uſe; ſuch as ſtatues, vaſes, &c. 2d, Objects in themſelves not beautiful, but poſſeſſing the beauty of utility, by impoſing on the ſpectator, and appearing to be uſeful; ſuch as blind windows. 3d, Where things are beautiful in themſelves, and at the ſame time aſſume the appearance of uſe; ſuch as pilaſters. With regard to the firſt, a ſtatue ſhould be ſo placed, that it may be ſeen in every direction, and at various diſtances, either in receding or advancing. Statues ought not to be placed in the niches of fronts of houſes, or on the tops of walls and roofs.—Their proper places are in large halls, and in paſſages that lead to a grand ſtair caſe, &c. To adorn the top of the wall with *vaſes*, is an abſurd conceit, by placing a thing, whoſe natural deſignation is utility, where it cannot have even the leaſt appearance of it. Firmneſs and ſolidity being the proper expreſſions of a pedeſtal, and, on the contrary, lightneſs, and delicacy of carved work, the pedeſtal, whether of a column or of a ſtatue, ought to be ſparingly ornamented. The ancients never ventured on any bolder ornament than the baſſo relievo.

(95.) As for ornaments of the 2d kind, it is a great blunder to contrive them ſo as to make them appear uſeleſs. A blind window, therefore, when neceſſary for regularity, ought to be ſo diſguiſed as to appear a real window: when it appears without diſguiſe, it is diſguſtful, as a vain attempt to ſupply the want of invention; it ſhows the irregularity in a ſtronger light, by ſignifying that a window ought to be there in point of regularity, but that the architect had not ſkill ſufficient to connect external regularity with internal convenience.

(96.) With regard to the 3d ſpecies of ornaments, it is an error to ſink pilaſters ſo far in the wall, as to remove totally, or moſtly the appearance of uſe. They ſhould always project ſo much from the wall, as to have the appearance of ſupporting the entablature over them.

(97.) Of all the ornaments in great buildings pillars are the chief. The deſtination of a pillar is to ſupport, either in appearance or reality, the entablature. With regard to the form of a pillar, it muſt be obſerved, that a circle is a more agreeable figure than a ſquare, a globe than a cube, and a cylinder than a parallelopipedon.—This laſt, in the language of architecture, is ſaying, that a column is a more agreeable figure than a pilaſter; and for that reaſon it ought to be preferred, when all other circumſtances are equal. Another reaſon concurs, that a column annexed to a wall, which is a plain ſurface, makes a greater variety than a pilaſter. Beſides, pilaſters are [illegible]

diſtance are apt to be miſtaken for pillars; and the ſpectator is diſappointed when, on a nearer approach, he diſcovers them to be only pilaſtres.

(98.) It is a queſtion, among architects, whether any new order can be added to the Doric, Ionic, and the Corinthian. Some hold the affirmative, and give for inſtances the Tuſcan and compoſite; others maintain, that theſe properly are not diſtinct orders, but only the original orders, with ſome ſlight variations. The only circumſtances, that can ſerve to diſtinguiſh one order from another, are the form of the column, and its deſtination. To make the firſt a diſtinguiſhing mark, without regard to the other, would be to multiply orders without end. Deſtination is more limited, and it leads us to diſtinguiſh three kinds of orders; one plain and ſtrong, for the purpoſe of ſupporting plain and maſſy buildings; one delicate and graceful, for the purpoſe of ſupporting buildings of the oppoſite character; and between theſe a third, for ſupporting buildings of a mixed nature. So that, if deſtination alone is to be regarded, the Tuſcan is of the ſame order with the Doric, and the Compoſite with the Corinthian.

(99.) The ornaments of theſe three orders ought to be ſuited to the purpoſes for which they are intended. Plain and ruſtic ornaments would not a little diſcord, with the elegance of the Corinthian order, and ſweet and delicate ornaments no leſs with the ſtrength of the Doric.

(100.) There are two general rules with reſpect to buildings of every kind. One rule, dictated by utility, is, that they be firm and ſtable. Another, dictated by beauty, is, that they alſo appear ſo to the eye; for every thing that appears tottering, and in hazard of tumbling down, produces in the ſpectator the painful emotion of fear, inſtead of the pleaſing emotion of beauty; and accordingly it ſhould be the great care of the artiſt, that every part of his edifice not only be well ſupported, but likewiſe appear to be ſo. Some have introduced a conceit in architecture, by giving parts of buildings the appearance of falling; of this kind is the church of St Sophia in Conſtantinople: the round towers in the uppermoſt ſtories of Gothic buildings are in the ſame falſe taſte.

(101.) The moſt conſiderable ornaments uſed in architecture are the five orders of columns, pediments, arches, baluſters, &c. which we ſhall now proceed to deſcribe.

PART II.

OF THE FIVE ORDERS OF ARCHITECTURE.

SECT. I. *Of the* SEVERAL PARTS *and* MEMBERS *of an* ENTIRE ORDER.

(102.) The principal parts of an entire order are three; the pedeſtal, ſhaft, and entablature.—Each of theſe are again ſubdivided into three ſmaller parts: The pedeſtal contains the plinth, (ſee Tuſcan order, Pl. X.) the dado, and the cornice. The column includes the baſe, the ſhaft, and the capital. The entablature conſiſts of an architrave, a frieze, and a cornice. The names require illuſtration.

(103.) 1. The PLINTH takes its appellation from πλινθος, a brick or flat ſquare ſtone, on which columns in the moſt early ſtate of architecture are ſuppoſed to have ſtood. 2. The DADO, or DYE, is ſo called becauſe it is of a cubic form. 3. The CORNICE is derived from *coronis*, a top or ſummit; becauſe the cornice is the extreme end or finiſhing of the pedeſtal. 4. The BASE of the column is from βασις, a foundation or footing for the column. 5. The SHAFT, that long and ſtraight part of a column comprehended between the baſe and capital, is ſo named from σκαπτω, to dig, in the manner of a well, round and deep, whoſe inſide reſembles the ſhape of a pillar. 6. The CAPITAL, from κεφαλη, or *caput*, the head, which the capital is to a column. 7. The ARCHITRAVE, from αρχος, chief or principal, and *trabs* a beam, becauſe the architrave is the chief ſupport to the whole entablature. 8. The FRIEZE is ſo called from φιζεον, a border or fringe, which ſome of the ancients uſed to call ζωφορος; becauſe their friezes were uſually enriched with the figures of animals. 9. The CORNICE of the *entablature*, or the crowning part of the entire border, is explained above.

(104.) Theſe nine principal parts of a complete order, the dado and ſhaft excepted, are compoſed of ſmall members, which conſtitute all that ſimple and pleaſing variety of mouldings which adorned the works of the ancients The names of theſe mouldings allude to their forms, and their forms are adapted to the purpoſes for which they were intended. See *Plate* XX. *fig.* 1, 2, 3, 4, 5, 6, 7, 8.

(105.) The names of the members, with their origin and uſe, are as follows. The figures refer to the parts numbered in the Doric Order, *Pl.* X.

Fig. 1. The FILLET, from the French word *fil*, thread.

2. The CYMATIUM, or *cyma recta*, from κυμαινω, a wave; becauſe this member reſembles the ſwelling and concavity of a wave.

3. The CYMA REVERSA, the preceding member inverted.

4. The CORONA, or crown, becauſe it is the principal member of the cornice, and ſerves as a ſhelter to the ſmaller mouldings of the entablature.

5. The OVOLO, from *ovum* an egg; becauſe this member by the ancients was frequently carved in the form of an egg.

6. The CAVETTO, from *cavus* hollow.

7. The CAPITAL, or upper fillet of the triglyph.

8. The TRIGLYPH, from τριγλυφος, three engravings, compounded of τρις, three, and γλυφω, to carve or engrave; in conformity to which the triglyph has two entire channels, and two half ones, with three ſpaces between.

9. The METOPE, from μεσος, the ſpace between one aperture or hole to another; the triglyphs being ſuppoſed to be joiſts that fill the apertures: hence the ſpace between the triglyphs, which forms an exact ſquare, is termed the *metope*.

10. The FRIEZE is explained above, § 103.

11. The BAND is the ſame as the fillet.

12. The GUTTÆ, or the DROPS, are of a conic figure.

13. The ARCHITRAVE. See the explanation, § 103.

14. The FACIA, or face; of theſe there are two in the architrave.

15. The ABACUS, from αβαξ, a ſhelf or table;

or, as ſome ſuppoſe, a tile, on which the ancient Greek mathematicians ſtrewed duſt, to draw their geometrical ſchemes on The word ſeems to have been introduced into architecture on the invention of the Corinthian capital, which took its riſe from an acanthus growing round a baſket. See ABACUS. See alſo Plate XX.

16. The OVOLO of the capital, which in this ſituation muſt be conſidered as the baſket round which the acanthus grew.

17. The ANNULETS; ſo called becauſe theſe ſmall fillets encompaſs the capital, like rings joined to each other. The moderns, in place of theſe, generally have a ſmall cavetto.

18. The COLORINO, the collar, or neck of the capital,

19. The ASTRAGAL, from αστραγαλος, a bone of the heel; or the curvature of the heel, which this member reſembles. The hollow which follows is termed αποφυγη, the ESCAPE, becauſe this part of the column appears to fly off.

20 and 12. The upper and lower TORUS, from τορος, a cable, which this moulding ſomewhat reſembles.

21. The SCOTIA, from σκοτια, darkneſs; becauſe of the ſtrong ſhadow which its concavity produces, and which is increaſed by the projecting torus above,

(104.) In ſome of the Doric entablatures, (ſee Pl. XXI.) are MUTULES, from *mutuli*, modillions, which are placed perpendicularly over each triglyph, and are of the ſame width; and whoſe projection in the corona is the ſame, forming a perfect ſquare. In others are DENTILES, as in the theatre of Marcellus at Rome, Theſe are ſo named from *dentes*, teeth, which they reſemble; and the flat members on which theſe dentiles are placed is termed *denticulus*. The capitals of the Ionic, Corinthian, and Compoſite, (ſee Plate X.) have each of them VOLUTES, ſo called from *volutum*, to roll round, as on a ſtaff. Some call the volutes the HORNS of the capital, becauſe they reſemble the twiſting of rams horns.

(107.) Thoſe parts of the different orders which are termed MOULDINGS are only 8 in number. (See *Pl.* XX.) viz. The fillet or cincture to bind the parts. The aſtragal alſo and torus, reſembling ropes or cables, are ſtrong builders and fortifiers of the parts with which they are connected. The ovolo is ſtrong at its extremities, and is therefore fit to ſupport projecting parts. The cyma recta, inverſa, and cavetto, are covering mouldings, which ſerve to ſhelter the other ſmaller members, There are various methods of deſcribing the contours of theſe; but the ſimpleſt and perhaps the beſt, is to form them of quadrants of circles, as is ſhewn in the plate.

(108.) An aſſemblage of what are called eſſential parts and mouldings is termed a PROFILE. The moſt perfect profiles are ſuch as are compoſed of few mouldings varied in form and ſize; and ſo diſpoſed, that the ſtraight and curved ones ſucceed each other alternately, When ornaments are employed in mouldings, ſome of them ſhould be left plain, in order to give a proper repoſe: for when all are ornamented, the figure of the profile is loſt,

SECT. II. *Of the* DIMINUTION *of* COLUMNS.

(109.) The ancients, in effecting the diminution of the ſhaft of a column, adopted a variety of methods; beginning ſometimes from the foot of the ſhaft, and at others from one quarter, or one third of its height; the lower part being perfectly cylindrical. The former of theſe was moſt in uſe amongſt the ancients, and, being the moſt natural and graceful, ought to have the preference, though the latter has been more univerſally practiſed by modern artiſts.

(110.) M. AUZOULT is of opinion, that the firſt architects probably made their columns in ſtraight lines, in imitation of trees; ſo that their ſhaft was a ſruſtum of a cone: but finding this form abrupt and diſagreeable, they made uſe of ſome curve, which, ſpringing from the extremities of the ſuperior and inferior diameters of the column, ſwelled beyond the ſides of the cone, and by that means gave a more pleaſing figure to the contour.

(111.) VITRUVIUS mentions this practice, but in ſo obſcure and curſory a manner, that his meaning has not been underſtood; and ſeveral of the modern architects, intending to conform themſelves to his doctrine, have made the diameters of their columns greater in the middle than at the foot of the ſhaft.

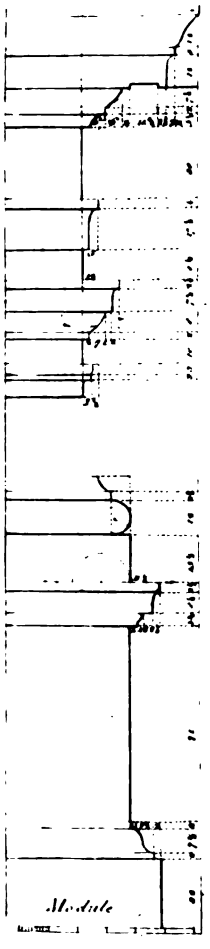
(112.) LEON BAPTISTA, Alberti, and others of the Florentine and Roman architects, have carried this to a very great exceſs; for which they have been juſtly blamed, as it is neither natural, reaſonable, nor beautiful. M. Auzoult obſerves that a column, ſuppoſing its ſhafts to be the ſruſtum of a cone, may have an additional thickneſs in the middle, without being ſwelled there beyond the bulk of its inferior parts; and ſuppoſes the addition mentioned by Vitruvius to ſignify nothing but the increaſe towards the middle of the column, occaſioned by changing the ſtraight line, which at firſt was in uſe, for a curve,

(113.) This ſuppoſition is extremely juſt, and founded on what is obſerved in the works of antiquity; where there is no inſtance of columns thicker in the middle than at the bottom, though all have the ſwelling hinted at by Vitruvius, all of them being terminated by curves; ſome granite columns excepted, which are bounded by ſtraight lines; a proof, perhaps, of their antiquity, or of their having been wrought in the quarries of Egypt by bungling and unſkilful workmen.

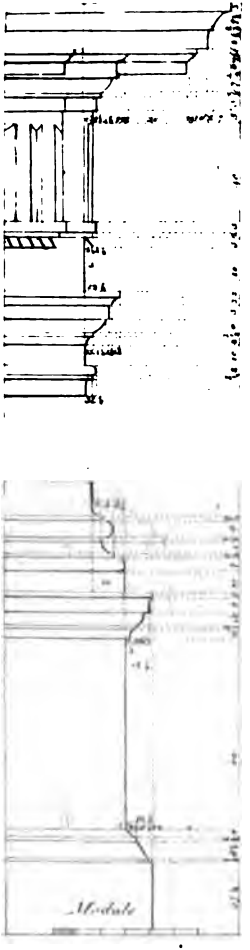
(114.) M. BLONDEL, in his work intitled *Reſolution des quatre principaux Problemes d' Architecture*, teaches various manners of diminiſhing columns; the beſt and ſimpleſt of which is by means of the inſtrument which Nicomedes invented to deſcribe the firſt conchoid: for this, being applied at the bottom of the ſhaft, performs at one ſweep both the ſwelling and the diminution; giving ſuch a graceful form to the column, that it is univerſally allowed to be the moſt perfect practice hitherto diſcovered. The columns in the Pantheon, accounted the moſt beautiful among the antiques, are made in this manner; as appears by the exact meaſures of one of them to be found in Deſgodetz's Antiquities of Rome.

(115.) To give an accurate idea of the operation,

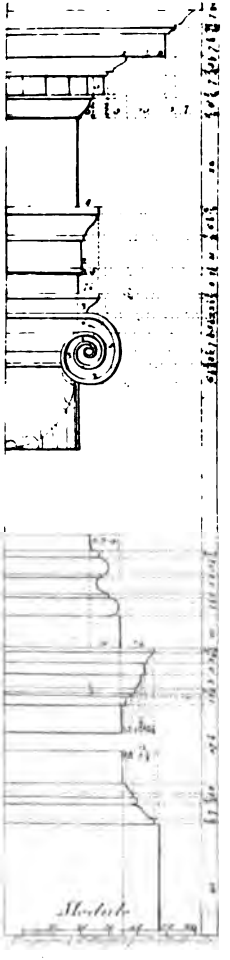
Tuscan.



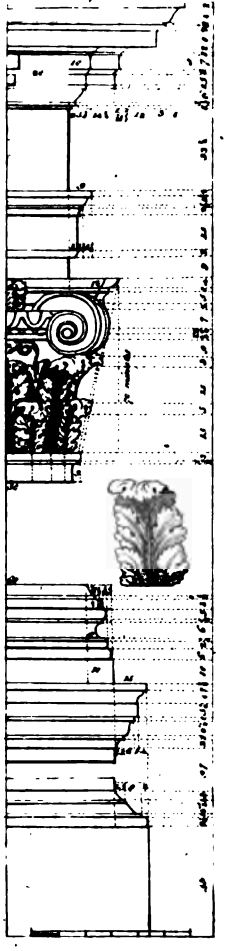
Doric.



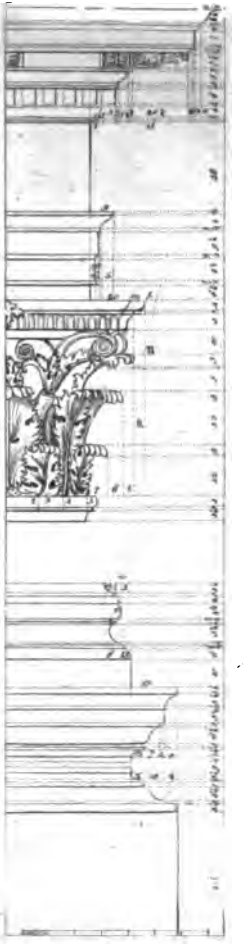
Ionic.



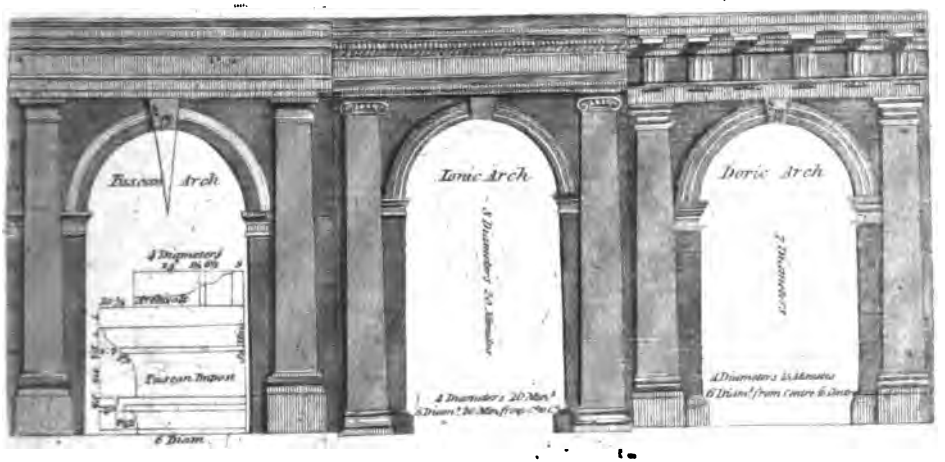
Composite.

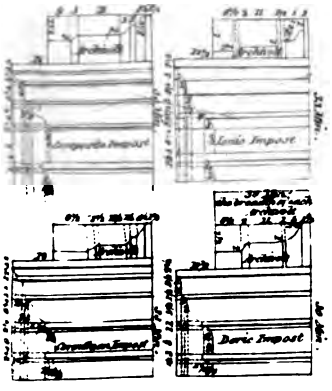


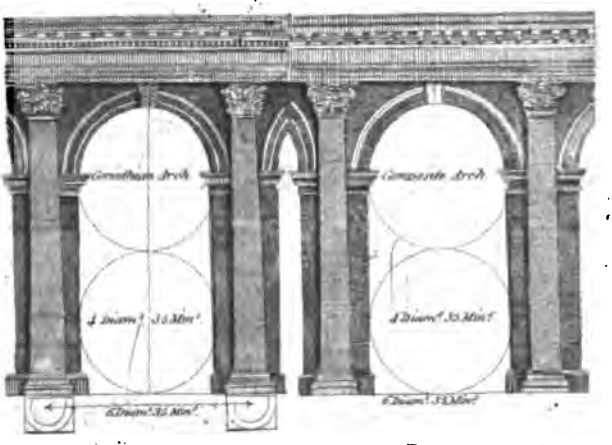
Corinthian.



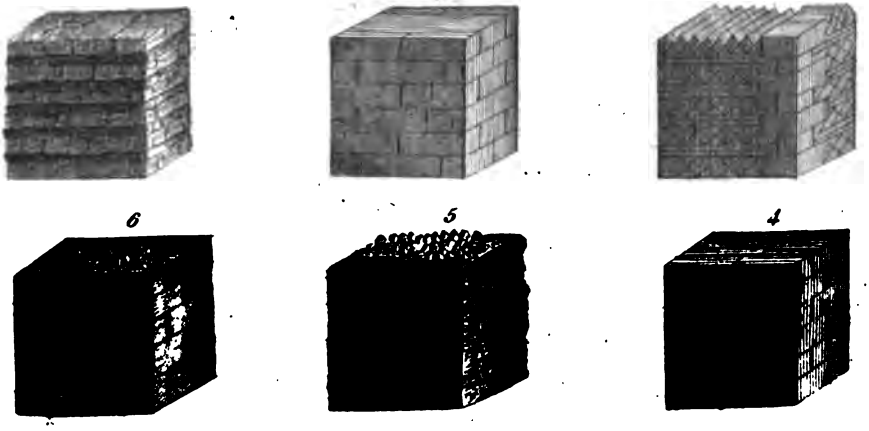
ARCHITECTURE.







Masonry

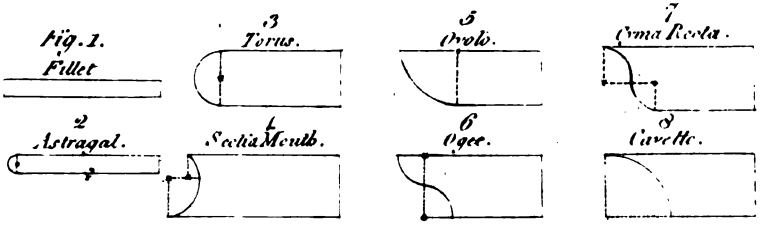


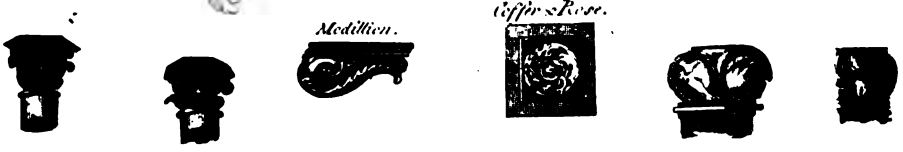
Antient Huts.

Fig. 1.

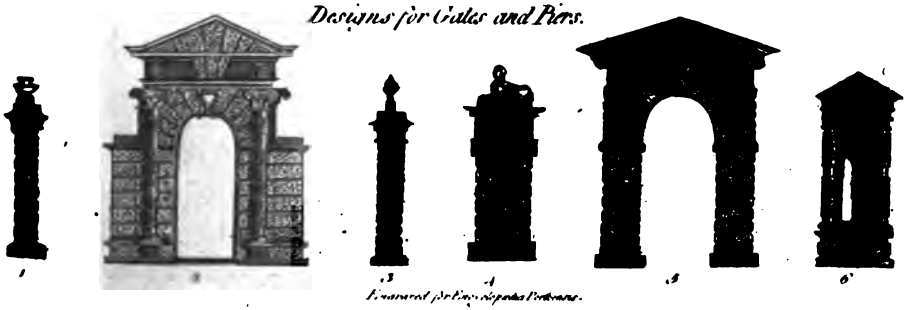
Fig. 2.

Fig. 3.





Designs for Gates and Piers.



Engraved for Encyclopedia Perthensis.

tion, it will be neceſſary firſt to deſcribe Vignola's method of diminution, on which it is grounded. Having determined the height of the ſhaft, draw a line indefinitely from D (Pl. XXI.) through C, perpendicular to the axis O P of the column; take then I D, half the inferior or largeſt diameter of the column, and place one foot of the compaſſes exactly on the extremity of the ſuperior or ſmalleſt diameter, as at R, and depreſs the other, till it come into the axis or centre line of the ſhaft, as at S under O; through theſe two points draw a line indefinitely and produced till it cut the line D C, as at A; from A, the centre, draw any number of lines through the axis O P, as S, *r*, S. *r*, &c.; and on each of theſe place half the larger diameter of the ſhaft ſet off from the axis or perpendicular line O P, through which points, thus found, if a curve line be drawn, it will deſcribe the ſwelling and proper diminution of the column.

(116.) Although this method be ſufficiently accurate for practice, eſpecially if a conſiderable number of points be found, yet, ſtrictly ſpeaking, it is defective; as the curve muſt either be drawn by hand, or by applying a flexible rule to all the points; both of which are liable to variations. Blondel, therefore, to obviate this objection, after having proved the curve paſſing from O to R through the points *r*, *r*, to be of the ſame nature with the firſt conchoid of the ancients, employed the inſtrument of Nicomedes to deſcribe it: the conſtruction of which is as follows. This inſtrument is made of wooden lathes in the triangular form deſcribed by PO, PC, and ABR, (Pl. XXI.) the baſe and perpendicular of which are joined together at P, and has a ſtay: the upright O P has a groove cut in it, (ſee the fig.) To the lath A B R at S is fixed a button, (ſee the fig.) which paſſes along the groove from P to O; in the moving lath A B R is a common groove, cut through from A to B; and at A, in the lath DC, is fixed a button at the centre A, as deſcribed in the firſt method. The length of the groove AB muſt exceed the difference of the length A S to A P; conſequently, as the bottom S works in the groove O P, the groove A B permits it to move forward to P, by which the former ſwelling and diminution will be moſt correctly performed when a pencil is fixed at R, at a diſtance from the button S equal to half the largeſt diameter of the column.

(117.) It muſt be owned, that if the centre were moved conſiderably towards P, that this method would not deſcribe a perfect curve or an agreeable diminution; for in this caſe, the curve at the top of the ſhaft will proportionally approach to a ſtraight line, and at laſt almoſt become an inverted curve. This, however, is no reaſonable objection to the uſe of the inſtrument when applied to the diminution of columns; for the greateſt quantity of diminution that can in any caſe be allowed, will not have the leaſt perceptive effect on the curve; and therefore we may venture to affirm, that no other method yet diſcovered, nor any other inſtrument that can be invented by man, is likely to exceed it. It is farther to be obſerved, that Nicomedes's inſtrument may be made to anſwer ſhafts of any dimenſions, by making the reſpective grooves capable of extenſion by the uſe of ſliders and moveable centres, which any architect is capable of contriving. In the remains of antiquity the quantity of diminution is various; but ſeldom leſs than one eighth of the inferior diameter of the column, nor more than one ſixth. The laſt of theſe is eſteemed the moſt perfect by Vitruvius; and is generally adopted by modern architects.

SECT. III. *Of the* ORIGIN, CHARACTER, USE, *and* PROPORTIONS *of the* TUSCAN ORDER.

(118.) This order, as its name evinces, originated in Tuſcany, one of the moſt conſiderable of the ancient Italian ſtates, which was firſt peopled by the Lydians from Aſia. They built temples of this order, and dedicated them to their idols in their new ſettlements. It is the moſt ſolid and ſimple of all the orders. It is compoſed of few parts, devoid of ornaments, and ſo maſſy, that it ſeems capable of ſupporting the heavieſt burden. There are no remains of a regular Tuſcan order among the antiques: the doctrine of Vitruvius concerning it is obſcure; and the profiles of Palladio, Scamozzi, Serlio, de l'Orme, and Vignola, are all imperfect. Vignola's is however preferred by moſt architects; and accordingly, a profile nearly approaching to it is given in Plate XVIII.

(119.) The Tuſcan order, on account of its ſtrong and maſſy proportions, has obtained the name of the *ruſtic order*; in conformity to which character, it is generally employed in farm houſes, ſtables, and the like edifices. It is however ſometimes uſed in ſuperior buildings, where ornaments are not required, but where ſtrength is the principal object. The proportion of the Tuſcan column, with its pedeſtal and entablature, is as follows:—Divide the whole height of the entire column into five equal parts, one of which is for the height of the pedeſtal; and the remaining 4 are aſſigned for the baſe, ſhaft, capital, and entablature. The whole height being divided into 5 equal parts, one is given for the entablature, and the remaining 4 being divided into 7 equal parts, one is for the inferior diameter of the ſhaft, in maſſy buildings, a more heavy entablature may be uſed, as was cuſtomary amongſt the ancients. They divided the whole height aſſigned to the baſe, ſhaft, capital, and entablature, into 4 equal parts and gave one to the entablature. The profiles of Vignola and Palladio have this proportion.

(120.) Take half of the inferior diameter, for the height of the baſe, including the plinth; and the ſame for the height of the capital, excluſive of the aſtragal. Take the inferior diameter, and divide it into 60 equal parts, which are called *minutes*, and by which the ſmaller parts of the columns, are proportioned in their height and projections, as ſpecified in the upright and horizontal ſcales attached to the profile, from which the ſeveral proportions of each moulding muſt be learned. A module is conſidered by ſome to be only half a diameter; but others extend it to a whole one, which we have adopted as the moſt ſimple and entire. Palladio uſes the whole diameter in every order except the Doric. Vitruvius alſo employs the large module, reckoning the proportion of the column by the lower or inferior diameter of the ſhaft; and we do not ſee that either the ſem-diameter or the 20 minutes contrived

by

by ſome will more nearly anſwer to the different parts of the column.

Sect. IV. *Of the* Intercolumniation *of the* Orders.

(121.) Columns are either engaged or inſulated; and when inſulated or detached from the wall, they are either very near, or at a conſiderable diſtance from it. When they are placed at a conſiderable diſtance from the wall, they are deſtined to ſupport the entablature; and their diſtance from each other ſhould be conſiſtent both with their real and apparent ſolidity. Engaged columns are attached to the wall, and are not limited in their intercolumniations, as they depend on the breadth of the arches, doors, windows, niches, or other decorations placed in them.

(122.) The ancients uſed five different ſpecies of intercolumniations, which, according to Vitruvius and Palladio, are as follows:

I. The Pycnostyle, of which the interval or ſpace is one and a half of the inferior diameter of the column.

II. The Systyle, whoſe interval is two diameters.

III. The Eustyle, two diameters and a quarter.

IV. The Diastyle, three diameters—and

V. The Aræostyle, four diameters.

(123.) The three firſt of theſe were uſed by the Grecians, in the Doric, Ionic, and Corinthian orders; but the diſtances of the triglyphs of the Doric determined the intercolumniations of that order, which we ſhall deſcribe in its place.

(124.) The ancient Romans preferred the Eustyle in moſt caſes, as the beſt medium of the too little and too great intervals of column; but in their Tuſcan works, they uſed a ſpace equal to four and ſometimes ſix diameters, which intercolumniations was admiſſible in this order, ſince the architrave was uſually formed of ſome kind of timber, when the other parts of the entablature were of ſtone. Palladio ſays, this intercolumniation of the Tuſcan order was adapted to farm houſes and other ruſtic works, as it afforded a paſſage for carts, and was attended with the leaſt expence. In ſtructures built entirely of ſtone, however, they uſed a ſhorter interval, more ſuitable to the length of their marble blocks, and more agreeable to the ponderous fabric which they occaſionally ſupported; for which reaſon the diaſtyle and euſtyle modes were ſometimes applied to this order.

(125.) The moderns have indeed adopted theſe two as their general rule, and apply them to every order except the Doric. The aræoſtyle, however, is ſometimes, by a modern contrivance, authoriſed by a few examples of the ancients, introduced in porticoes and periſtyles. This mode of the aræoſtyle is from Perrault, and is managed by placing 2 columns together at the angles, ſo cloſe as to admit the two capitals nearly into contact. This manner, which is termed grouping, takes off from the exceſſive width of this kind of interval, whilſt it adds to it both real and apparent ſtrength, as is exemplified in St Paul's church in London, and in the palace of the Louvre at Paris.

Sect. V. *Of* Arches *and their* Ornaments.

(126.) Arches are not ſo magnificent as colonnades; but they are more ſolid and leſs expenſive. They are proper for triumphal entrances, gates of cities, of palaces, of gardens, and of parks, and, in general, for all openings that require an extraordinary breadth. There are various manners of adorning arches. Sometimes their piers are ruſticated; ſometimes they are adorned with pilaſters, termini, or caryatides; and ſometimes they are made ſufficiently broad to admit niches or windows.

(127.) The circular part of the arches is either ſurrounded with ruſtic key ſtones, or with an archivolt enriched with mouldings; which, in the middle, is ſometimes interrupted by a conſole, or maſk, ſerving at the ſame time as a key to the arch, and as a ſupport to the architrave of the order. The archivolt is ſometimes ſupported by an impoſt, at the head of the pier; and at others by columns placed on each ſide of it, with a regular entablature, or architrave and cornice.

(128.) There are likewiſe inſtances of arcades without piers, the arches being turned on ſingle columns, as in the temple of Faunus at Rome, &c. But this practice ought not to be imitated, as it is neither ſolid nor handſome. When arcades, however, are employed to ornament domeſtic apartments, the breadth of the pier muſt not exceed one quarter of the opening of the arch.

(129.) When arches are cloſed up, to receive doors, windows, or niches, the receſs ſhould be ſufficient to contain all the projections of what is placed therein, otherwiſe their appearance is clumſy, and will become too principal, which produces a bad effect in the compoſition. When arches are large, the key ſtone ſhould never be omitted, but cut in the form of a conſole, and come cloſe under the ſoffit of the architrave, which, on account of its extraordinary length, requires a ſupport in the middle. The impoſts of arches ſhould never be omitted; at leaſt, if they be, a platform ought to ſupport their place. If columns are employed without pedeſtals in arcades, they ſhould always be raiſed on a plinth.

(130.) In arches of great magnitude, the circular part ought not to ſpring immediately from the impoſt, but take its riſe at ſuch a diſtance above it as is neceſſary in order to have the whole curve ſeen at the proper point of view. The width of aperture of arches ſhould never be higher, nor much lower, than double their breadth; the breadth of the pier ſhould ſeldom exceed two thirds, nor be leſs than one third of the breadth of the arch; and the angular pier ought to be broader than the others, by one half, one third, or one fourth: the impoſt ſhould not be more than one ſeventh, nor leſs than one ninth of the aperture; and the archivolt muſt not be more than one eighth, nor leſs than one tenth of it. The breadth of the conſole muſt, at the bottom, be equal to that of the archivolt; and its ſides muſt be drawn from the centre of the arch; the height of it muſt not be leſs than one and a half of its ſmalleſt breadth, nor more than double. The thickneſs of the pier depends on the breadth of the

the portico; for it must be strong enough to resist the pressure of its vault. But with regard to the beauty of the building, it should not be less than one quarter of the breadth of the arch, nor more than one third. These are the general dimensions of arches.

(131.) The proportions peculiar to the Tuscan arch, of which we have given an example, without pedestals, are as follows: In height, their aperture is 7 diameters and a quarter, in width 4, and from centre to centre of the columns, 6 diameters. According to the preceding remarks, the archivolt and imposts are half a diameter, and from the top of the archivolt to the underside of the architrave should not be less than 15 minutes The breadth of the key stone at the bottom is equal to its archivolt; and its spreading sides are determined by lines drawn from the centre of the arch, as is shewn in the plate. The plinth is one diameter in height, and the proportions of the column and entablature are the same with the Tuscan profile, PLATE XVIII. For the proportions of the moulding of the archivolt and imposts, see PLATE XIX.

(132.) The Tuscan arch with pedestals is in width $4\frac{1}{2}$, and in height 8 diameters, and a quarter; and from centre to centre of each pier is $6\frac{1}{2}$. In every other particular they are subject to the preceding rules.

SECT. V. *Of the* ORIGIN, CHARACTER, USE, *and* PROPORTIONS *of the* DORIC ORDER.

(133.) The DORIC order derived its name from the Dorians, a nation of ancient Achaia, from whom it doubtless received the proportions and derived most of the parts by which it has been distinguished from orders of later date. The Doric, as to its character, is by architects considered grave, robust, and of masculine aspect: hence it is figuratively termed the *Herculean* order. The ancients accordingly used it in their temples dedicated to Juno, Minerva, Mars, and Hercules, whose grave and heroic dispositions suited well the solemn character of this order.

(134.) This order may be properly used in colonnades, porticoes, halls, gates of cities, and public buildings erected in memory of heroes, or famous personages. In most of the antiques, the Doric column is executed without a base. Vitruvius makes it without one; the base, according to him, having been first employed in the Ionic, order, in imitation of the sandals worn on women's feet. Scamozzi blames this practise, and most of the moderns are of his way of thinking.

(135.) The remarks of LE CLERC, in opposition to De Chambre, are worthy of notice. The latter asserts, that the Doric column is after the model of a strong man who is constantly represented bare footed. He also observes, that the base to a column is the same as a shoe to a man, and therefore censures the use of a base as improper and unchaste. Le Clerc admits, that the most ancient Dorics were destitute of bases, though he considers it difficult to assign any good reason for it. "But I must own, (says he) I cannot consider a column without a base, in comparing it to a man but I am at the same time struck with the idea of a person without feet rather than shoes; for which reason I am inclinable to believe, either that the architects of antiquity had not yet thought of employing bases to their columns, or that they omitted them in order to have the pavement clear; the angles and projection of bases being stumbling blocks to passengers, and so much the more troublesome, as the architects of those times frequently placed their columns very near each other; so that had they been made with bases, the passages between them would have been extremely narrow and inconvenient; and it was doubtless for the same reason that Vitruvius made the plinths of his Tuscan column round: that order according to his construction, being particularly adapted to servile and commercial purposes, where convenience is preferable to beauty. However this be, persons of good taste will grant, that a base not only gives a graceful turn to the column, but is likewise of real use, serving to keep it firm on its plan; and that columns if without bases are now set aside, it is a mark of the wisdom of our architects, rather than an indication of their being governed by prejudice, as some adorers of antiquity would insinuate."

(136.) In conformity to the arguments of this celebrated author, and agreeably to the practice of Palladio and of our modern architects, we have introduced an attic base to this order; yet, in ornamental temples, for gardens, &c. we are decidedly of opinion, that the Grecian style should be copied strictly and preserved chaste, according to the remains of antiquity, as discovered by both ancient and modern architects, who have with great diligence and expence explored their ruinous piles to obtain accurate measurements of the several parts: particularly our countryman JAMES STUART, Esq. who in three folio volumes, has presented to public view the antiquities of Athens, in which we have a clear display of pure Grecian architecture. In these we see, as well as in other works, that the Doric column was without a base, but its shaft decorated with a number of channelings or flutings peculiar to itself; for in the other orders, an interval or fillet is introduced between each fluting, but in this it is otherwise. Hence Scamozzi's censure of this manner of fluting is imperfect, in consequence of the projecting angles which separate each flute, which renders the shaft tender and more subject to decay. The force of this objection however will be greatly abated, when it is considered, that these flutings are shallow, having their centre from the summit of an enquilateral triangle, whose sides are equal to the width of the flute; consequently, it is little more than one quarter of the depth of the other kinds of fluting which are perfect semicircles. It is also to be observed, that the Grecian temples were composed of hard stone or marble, not subject to decay, and preserved from outward violence by a religious or rather a superstitious care: and without some sort of care, even the angles of the Ionic or Corinthian fluting will become an easy prey to the injuries of outward violence.

(137.) The other members which mark the peculiar feature of this order are the triglyph and mutule. The mutules are considered as a memorial or imitation of the primitive huts (see *Plate* XX. *fig.* 2 & 3,) whose beams are seen to project out-

outwardly under the roof; but the triglyph is thought by ſome to be emblematical of the uſe of the firſt temple, erected according to this order, which was dedicated to Apollo, to whoſe harp the triglyph bears ſome ſort of reſemblance. The *metope*, or ſpaces between the triglyphs, have been variouſly enriched. Palladio introduced ox's ſculls, with lighted torches hanging from each horn, and placed alternately with pateras, expreſſive of the ſacrificial offerings performed to the heathen deities.

(138.) Various other ornaments may, however, be introduced with propriety, both in public and private buildings. In the latter, creſts, and badges of dignity, heads, vaſes, or pateras, encircled with garlands of oak or laurel, are very ſuitable; in military ſtructures, heads of Mars, Meduſa, or the Furies, may be admitted. But ſome architects object to the introduction of ſwords, ſpears, or the like weapons, as being of too large dimenſions for ſuch ſmall compartments, and which, to repreſent in miniature, would be too trifling, and inconſiſtent with the dignity of ſuch works. When this order is employed in churches and other religious edifices, the metope may have cherubs, chalices, doves, garlands of palm and olive, and other devices, emblematical of moral virtues: but the moſt elevated parts of all theſe ſhould project little more than the triglyph. This rule was ſtrictly obſerved by the ancients, who ſeldom gave their ornaments more projection than that of the borders in which they were incloſed. Agreeably to this idea, the ſoffits of the corona (ſee *Plate* XXI.) have their ornaments within the thickneſs of the borders which receive them.

(139.) The following are the proportions of the principal parts of this order, as appear in its profile, in *Plate* XVIII. The whole height of the entire order is divided into five equal parts, one of which is the height of the pedeſtal; and the remaining 4, which are aſſigned to the column and entablature, are likewiſe to be divided into five. One of theſe belongs to the entablature, and the remaining 4 being divided into 8 equal parts, one of them will be the inferior diameter of the column. Or we may expreſs it thus:

(140.) The whole height of the order, including its pedeſtal, is 12 modules and a half, reckoning the module a whole diameter. The pedeſtal is two and a half; the baſe, ſhaft, and capital 8; and the whole entablature two modules. Dividing the large diameter into 60 equal parts, called *minutes*; 30 are given to the baſe, 30 to the capital, 30 to the architrave, 45 to the metope, and 45 to the height of the cornice, including the upper fillet or capital of the triglyph. In this order, when the mutules are introduced in the entablature, as in the example referred to, one module is aſſigned for the projection of the cornice, which in this reſpect, exceeds any of the other orders. The projection of the mutules is equal to their width, being 30 minutes: the width of the triglyphs is exactly the ſame, and their diſtance from each other equal to the height of the metope, which, by this diviſion, forms a perfect ſquare. The ſides of the channels of the triglyphs are at right angles with each other. The manner of dividing and drawing them, together with the conic drops may be learned from *Plate* XXI. The ſoffit of the mutule, and that of the corona, are frequently ornamented; the former with conical drops, ſimilar to thoſe under the triglyphs, and the latter with roſes in ſquare and lozenge compartments. (See *Plate* XXI.) The proportions of the ſmaller parts, and of the ſeveral mouldings which compoſe the whole, muſt in this, and in every other order, be learned from their reſpective profile.

(141.) NAMES *of the* DIFFERENT PARTS, *referred to by* Figures *in the repreſentation of the* DORIC ORDER: *Plate* X.

CORNICE. 1. The Fillet. 2. The Cymatium. 3. The Cyma reverſa. 4. The Corona. 5. The Ovolo. 6. The Cavetto. 7. The capital of the Triglyph. The FRIEZE. 8. The Triglyph. 9. Metope. 10. The Frieze. The ARCHITRAVE. 11. The Band or Tœnia. 12. The Drops. 13. The Architrave. 14. Ditto firſt Facia. The CAPITAL. 15. O. G and Abacus. 16. The Ovolo. 17. The Annulets. 18. The Colorino. 19. The Aſtragal.

(142.) The BASE of the SHAFT. 20. The Upper Torus. 21. The Scotia. 22. The Lower Torus. 23. The Plinth. The CAPITAL of the PEDESTAL. 24. The Cyma inverted. 25. The Facia. 26. The Hollow. 27. The Dado. The BASE of the PEDESTAL. 28. The Aſtragal. 29. The Cyma. 30. The Plynth.

SECT. VII. *Of the* INTERCOLUMNIATION *and* ARCHES *of the* DORIC ORDER.

(143.) THE intercolumniation of this order is often attended with peculiar difficulty, ariſing from the ſtrict regard that is ever paid to the due width of the triglyph, and the perfectly ſquare form of the metopes, or their intervals. Beſides, it is abſolutely requiſite, that a triglyph ſhould be placed exactly over the centre of every column. For theſe reaſons, the mutules and triglyphs have been omitted in capital works, both ancient and modern, as in the Coliſeum at Rome, and the Royal Hoſpital at Greenwich.

(144.) PALLADIO has, however, given one inſtance of an ancient temple, with angular triglyphs. This ſtructure, which he terms the *Temple of piety*, is mentioned by Vitruvius, with an eye to the difficulty occaſioned by the triglyphs being thus placed; which reduces the intercolumniation of the two angular columns to one diameter and a quarter, which is leſs than the pycnoſtyle. The next intercolumniation is ſtill greater, approaching near to the pieroſtyle, as is evidently neceſſary to bring the triglyph over the centre of the third column from the angle. The next which is the centre intercolumniation, and faces the entrance of the temple, is rather more than euſtyle, or two diameters and a quarter; and has, in the metopes, ditriglyph. But the intervals, between the triglyph are much too narrow for their height, ſo as to produce an unfavourable effect. The other ſpaces are monotriglyph, and are perfect. The regular intercolumniation of the Doric order is the monotriglyph, or pycnoſtyle, which admits of one between two columns.—

The

The ditriglyph, or euſtyle, admits two; and the aræoſtyle is tritriglyph, or conſiſting of three; but the moſt perfect of theſe is the ditriglyph.

(145.) When the capitals and baſes of coupled Doric columns have their proper projections, and are at any diſtance from each other, the metope between them will be rather too wide; but that may be avoided, by confining the projections, or making the triglyph one minute more than it really ſhould be, and placing or removing its centre a minute within the axis of the column, which trifling differences will not be perceived without the niceſt examination.

(146.) In ſmall buildings, ſuch as temples, and other ſimilar ornaments for gardens, the intercolumniations may be determined, without paying a ſtrict regard to the general rules for the diſtances of columns; always obſerving, however, that ſuch works muſt have an interval that will admit of an eaſy paſſage between them.

(147.) Doric arches, without pedeſtals, (ſee pl. XIX.) are ſeven diameters and three fourths high, and in width four diameters and 15 minutes.—The piers are two modules in front, and in thickneſs one module, 22½ minutes; or in proportion to their diſtance from the wall. From centre to centre of each pier, is 6 diameters and 15 minutes. Arches of this order, with pedeſtals, have their apertures, in height, 9 diameters and 30 minutes; and in their width, 5 diameters, 15 minutes. The piers are 2 diameters, 15 minutes wide in front; and from centre to centre of each, is 7 diameters, and 15 minutes.

SECT. VIII. *Of the* IONIC ORDER, *with its* VOLUTES.

(148.) THE Ionic order owes its invention to the people of Ionia, who inhabited a Grecian diſtrict, and is ſaid to have been firſt employed in the decorations of the Temple of Diana, at Epheſus. The Ionic column is more ſlender and graceful than the Doric. Its ornaments are truly elegant, being in a ſtyle of compoſition between the richneſs of the Corinthian and plainneſs of the Tuſcan orders. Its general appearance being ſimple, yet graceful and majeſtic, in figurative language, it has been compared to a ſedate matron, in decent, rather than in rich attire.

(149.) The ancients uſed the Ionic order in the temples dedicated to Diana, Juno, Apollo, Fortune, Concord, and the like deities. It may be employed in palaces and private houſes, in halls of juſtice, colleges, or libraries; and, in ſhort, as Le Clerc obſerves, in all places conſecrated to peace and tranquillity. In forming the profile, and in adjuſting the proportions of this order, moſt of the modern architects have, in a great degree, imitated the columns, capitals, and entablatures in the Temple of Manly Fortune and Concord in the Theatre of Marcellus, and the Temple of Rome. Amongſt the ancients, the Ionic profile appears to have been [illegible] determined, than that of any o[ther] [illegible] the antiques at Rome, ex[cept] [illegible] of Concord, it is exactly the [illegible]

[illegible] of the principal parts [illegible] are as follow: The height of the entire order is divided into 5 equal parts. One of theſe parts is aſſigned to the height of the pedeſtal; and the remaining 4 are divided into 6, for the column and entablature. One of theſe is appropriated to the entablature, and the remaining 4 are for the column, including its capital and baſe. Theſe 4 being divided into equal parts, 1 is aſſigned for the inferior diameter. The cornice is 44 minutes in height, and its projection the ſame. The drip in the under ſide of the corona is channelled out one minute deep, and two minutes from the front; and before the cyma reverſa, one minute

(151.) the ſhaft of the column is ſometimes fluted, and ſometimes plain. Twenty, or 44 are the number of flutes allotted, not only to this, but to every other order. In general, however, 24 are preferable. The plan of the flutes may be rather more than a ſemicircle, as they will then appear more diſtinct. The fillets, or intervals between them, muſt not be broader than one third of the flutes, nor leſs than one fourth: and it ſhould farther be obſerved, that in the capital of rich compoſitions over each flute, is placed an ove or egg. For the other particulars, recourſe muſt be had to plates X. and XVIII. In exterior works, when the building is large, the entablature may be enlarged to one fourth of the whole column without its pedeſtal, as was ſometimes practiſed by the ancients. Palladio, however, makes no diſtinction of this nature; but allows only one fifth part of the height of the column in all caſes.

(152.) The VOLUTE, which is a principal member of this column, is executed in various forms. The Grecian volute has a double fillet winding round to its eye, which, by the partings or ſpaces between, produces a variety of light and ſhade, and affords to the whole convolution additional grace and beauty. We are not of opinion, however, that the necking is any additional beauty to the capital, as is ſuppoſed by ſome architects: for the aſtragal certainly takes off from that pleaſing ſimplicity, and pure elegance of the Roman capital, which is uninterrupted by any projecting moulding, till we view the eaſy turn of the volute itſelf. Upon theſe principles, we prefer the Roman capital. (See its profile. Plate XVIII.) Both the Grecian and Roman capitals are ſquare on the front, but have quite a different appearance when viewed on their ſides. See the plan in Plate XXI. It might therefore be eligible, when the decoration is to be continued in flank, as well as in front, to ſubſtitute the angular capital, uſed by Michael Angelo, Scamozzi, and other modern architects, in imitation of thoſe in the Temple of Concord. This capital is alike on all ſides; and therefore, occaſions no difficulty in the management of angular pilaſters or columns: its abacus is drawn in the ſame manner as that of the Corinthian order.

(153.) The manner of DRAWING the VOLUTE, according to Goldman's method, is as follows: (ſee Plate XXI.) Draw the perpendicular F A, termed the cathetus, and make its length equal to 15 minutes. On the centre deſcribe a circle, whoſe diameter is 3½ minutes. Draw next a geometrical ſquare, having its ſides equal to the radius of the circle, as 1, 2, 3, 4. From the angles 2, 3, draw diagonals to the centre at C. Divide

the ſide of the ſquare 1, 4, into 6 equal parts, as at 5, 9, 12, 8; and from theſe points draw parallel lines to the diagonals, as ſhewn in the eye of the volute; whence will be obtained 12 centres, by which every arch compoſing the volute may be accurately drawn, each of them coinciding with the other. Thus, on the centre 1, fix one foot of the compaſs, and extend the other to F; and with this opening, deſcribe the arch F G. On the centre 2, with the other foot extended to G, deſcribe the arch G H. On the centre 3, extending it to H, deſcribe the arch H I; and on the fourth centre deſcribe the arch I K, which completes one revolution. Proceed then in the ſame way, to the centres 5, 6, 7, 8, for the ſecond revolution; and to 9, 10, 11, 12, for the third revolution. Thus it appears, that the whole convolution conſiſts of 12 quadrants of circles, of ſo many different diameters.

(154.) To graduate the fillet, conſtruct a triangle at O, of which the ſide F A is equal to that part of the cathetus, contained from A to F; and the ſide V F, equal to half the ſide of the ſquare in the eye of the volute *a*, C, 1. Draw then the line S T, at a diſtance from V F, equal to the breadth of the fillet at F S, which may be 2 minutes, or 1 and 7 8ths. Take the ſpace S T, and place it each way from the centre of the volute, as from C to 3. Divide S T into 3 equal parts, as at 1, 2, 3, in the eye of the volute, and from theſe points draw parallel lines to the diagonals, which will find twelve new centres; and proceeding from one to the other, as was done in drawing the exterior contour, the regular diminution of the fillet may be accurately performed.

(155.) With reſpect to the INTERCOLUMNIATION of this and the ſucceeding orders, what has been obſerved on the ſubject, in SECTIONS IV. and VII. may ſuffice: And, as to the ARCHES peculiar to each order, all that is neceſſary, after what has been remarked on the two preceding orders, SECTIONS V. and VII. is a careful inſpection of plates XVIII. and XIX. where we have marked the peculiar proportions, in ſo many whole diameters, or parts of a diameter or module.

SECT. IX. *Of the* COMPOSITE ORDER.

(156.) This order had its origin amongſt the ancient Romans, and Serlio is ſaid to have been its inventor. In its ſtyle of compoſition, it partakes of the Ionic and Corinthian orders, but moſtly of the latter; particularly in the leaves of its capital. Some architects, however, do not incline to ſpeak well of this order, merely on the principal of its being a compoſition from the others. But this, in itſelf, is not a ſufficient ground for objection, ſince the ſame may be ſaid of the Tuſcan order, which is a compoſition from the rude ſtate of the Doric. On the other hand, we freely acknowledge, that the Compoſite order is ſo complete an imitation of the Corinthian, that at firſt ſight, the little difference between them will even deceive the eye of a tolerable judge.—This ſhews the compoſition at leaſt defective, if not bad; for why are two orders of architecture ſcarcely to be diſcriminated, but by the eye of a ſkilful architect? In confirmation of this, it may further be obſerved, that this is not the caſe with any other of the orders. The mereſt novice in architecture, can at firſt view diſtinguiſh the Tuſcan order from the Doric, and the Ionic from the Corinthian, as the parts which principally characterize each are ſtrikingly different.

(157) Taking this order, however, as it is, in conformity to the beaten path of cuſtom, its affinity to the Corinthian certainly entitles it to be claſſed in the rank of the rich, delicate and virginal orders. Conſiſtently with this character, it was uſed in temples conſecrated to female deities, and the all-conquering Romans, to expreſs their dominion over thoſe nations that invented the orders of which this is compoſed, uſed it more frequently in their triumphal arches, than in any other buildings. Where elegance and magnificence are to be united, it may be employed with propriety, and is adapted for buildings intended to commemorate any ſignal event, or to celebrate the virtues and actions of legiſlators and conquerors: becauſe the capitals and other ornaments may be compoſed of emblems and alluſive repreſentations, agreeably to the practice of the ancients.

(158) The Compoſite order is generally placed laſt of the five, on account of its being a compound or thoſe of the lateſt invention. But, according to this reaſoning, the Doric ſhould be firſt in order, as it was certainly the moſt ancient.—There are, however, two reaſons, which have induced us to place this order as the fourth. The firſt is, that when this order is employed, where orders are upon orders, as in large and magnificent ſtructures, it holds this place in their arrangement over each other; in which we ſee, firſt the Tuſcan, then the Doric, afterwards the Ionic; fourthly, the Compoſite, and laſtly, the Corinthian. The ſecond reaſon we aſſign, is, the degree of richneſs and delicacy, which is obſervable in regular gradation through the whole: for, as they decreaſe in ſtrength, they increaſe in richneſs of ornament, by which their elevation from the ground is always regulated.

(159.) On this ſubject, Sir William Chambers has the following remark. "Moſt authors give the laſt place to the Compoſite order, as being the laſt invented, and a compound; which of courſe ought to be preceded by all the ſimples. I have followed Scamozzi's method, his arrangement appearing to me the moſt natural: for his orders ſucceed each other according to their degrees of ſtrength; and in the progreſſion that muſt abſolutely be obſerved, whenever they are employed together."

(160.) The following are the general proportions of this order: The height of the entire order is divided into 5 equal parts, 1 of which is appropriated for the height of the pedeſtal, and the remaining 4 for the column and entablature. Theſe 4 parts being again divided into 6; 1 is for the entablature, and the remaining 5, for the height of the column, including its baſe and capital. The height of the column is divided into 10 equal parts, 1 of which is given to the inferior diameter. The baſe is 30 minutes, the capital 70 in height, adorned with acanthus leaves, and volutes, drawn by the ſame method as thoſe of the

the Ionic: and the plan of the capital is the same with that of the Corinthian order.

(161.) The soffit of the corona is divided into square compartments, cut out of the solid, decorated with roses, whose relief must not project more than the borders which inclose them. In rich compositions, the soffits of the modillions are also ornamented; but their relief is not to exceed the horizontal surface, which would greatly injure the effect of the modillion, and render the appearance of the profile of the entablature less pleasing.

SECT. X. *Of the* CORINTHIAN ORDER.

(162.) The lovers of architecture are indebted to the city of Corinth for this finest of all architectural compositions; in which we see proportion, simplicity, elegance, and richness, combined to a degree almost exceeding imagination, and which we are persuaded will never be surpassed, whilst architecture has an existence. This order is, and will continue to be, a perpetual memorial of the exquisite taste and genius of the ancient Corinthians. Scamozzi calls it the *virginal order*, an epithet truly characteristic of the delicacy and tenderness of composition apparent in the whole.

(163.) Conformably to the whole of its character, the ancients employed it in works of magnificence, grandeur, and delicacy. It obtained a place in palaces, public squares, banqueting rooms, theatres, and the apartments of young ladies. It was also generally used in temples dedicated to female deities, and sometimes in those of Jupiter, Mars, and Mercury. The most perfect model of the Corinthian order is generally allowed to be shewn in the three columns in the Campo Vaccino at Rome, the remains, as it is supposed, of the temple of Jupiter Stator.

(164.) The base of the column may be either Attic or Corinthian, since both are beautiful. The entablature is generally much enriched, particularly by the ancients, who introduced in the frieze representations of various figures. See PLATE X. A very full display of these may be found in Stewart's Antiquities of Athens. When the entablature is thus enriched, the columns are fluted, and the flutings may be filled with cablings, one third from the bottom of the whole height of the shaft, as in the inside of the Pantheon. In most of the antiques at Rome, the capital of this order is decorated with olive-leaves; the acanthus being seldom employed but in the Composite.

(165.) The following are the general proportions of this order: The whole height of the entire order is divided into 5 equal parts, and one is given for the height of the pedestal. The remaining four are divided into six equal parts; one is assigned for the entablature, and the remaining five are assigned to the height of the column including its base and capital; which are again divided into equal parts, one of which is for the inferior diameter. The base is 30 minutes, and the capital [illegible] 30 in height. The cornice is 48 minutes, [illegible] in height and projection.

[illegible] The soffit of the corona is worked in [illegible] compartments, as in the Composite; but [illegible] modillion is ornamented with an [illegible] in the capital. The breadth of the modillion is 10 minutes and a half; and the space between each modillion twice their width. The abacus of the capital is sometimes plain, and sometimes fluted, as in this profile. In some capitals the volutes rise higher than the under side of the abacus, but the capital looks best when they are bounded by its under surface.

(167.) To determine the plan of a capital according to the ancients, draw a geometrical square whose sides are one diameter and a half. To this square draw diagonals; and on these, place from the centre, or their intersection, a space equal to one diameter, through which point lines being drawn at right angles with the diagonals, will determine both the projection and thickness of the volutes. For the curvature of the abacus, extend the compasses from one angle to the other of the side of the abacus; and with this opening, intersect two arches described from the angles of each horn of the abacus; and the point of intersection will be the centre, by which, with the same opening of the compasses, the concavity of the abacus will be accurately drawn. See the PLAN, in Pl. X.

SECT. XI. *Of* PILASTERS *in* GENERAL.

(168.) Pilasters differ from columns only in their plan; which is a square, as that of columns is round. Their bases, capitals, and entablatures, have the same parts, with the same heights and projections, as those of columns; they are also distinguished in the same manner, by the names of *Tuscan, Doric, Ionic, Corinthian*, and *Composite*.

(169.) The column is undoubtedly more perfect than the pilaster. However, they may be employed with great propriety on many occasions. Some authors declaim against pilasters, because, according to them, they do not admit of diminution. But this is a mistake; there are many instances, in the remains of antiquity, of their being diminished. Scamozzi always gave his pilasters the same diminution as his columns: Palladio and Inigo Jones have likewise diminished them in many of their buildings.

(170.) Pilasters are employed in churches, galleries, halls, and other interior decorations, to save room; for, as they seldom project beyond the solid wall above one quarter of their diameter, they do not occupy near so much space as columns. They are likewise used in exterior decorations; sometimes alone, instead of columns, on account of their being less expensive; and sometimes they accompany columns, being placed behind them to support the architraves, where they enter the building, as in the Pantheon at Rome; or, in the same line with them, to fortify the angles, as in the Portico of Septimius.

(171.) Pilasters should project one quarter of their diameter beyond the walls, when used alone. When placed behind columns, especially if they be very near them, they need not project above one eighth of their diameter. But, when placed on a line with columns, their projection must be regulated by that of the columns; and consequently, it can never be less than a semi-diameter, even when the columns are engaged as much as possible.

(172.) The shafts of pilasters are frequently adorned with flutings in the same manner as those of columns; the plan of which may be a trifle

more than a ſemicircle: their number muſt be 7 on each face, which makes them nearly of the ſame ſize with thoſe of columns. Their intervals, or fillets, muſt either be one third or one fourth of the fluting in breadth. The capitals of pilaſters are profiled nearly in the ſame manner as thoſe of columns.

Sect. XII. *Of* Attics.

(173.) Attics very properly follow the pilaſters; being nothing more than ſquare pillars with their cornices. They had their origin in Athens, where it was for many ages a rule in building to conceal the roof. For this purpoſe, nothing ſerved ſo well as a kind of low or little order ranged in a continued line, ſingly, or with the interruption of baluſters; which, riſing above the reſt of the work and before the roof, hid it perfectly, and placed ſomething agreeable in view. The place of Attics, therefore, is at the uppermoſt extremity of a building, to which they ſerve as a crown, or very properly make a finiſhing for the other orders when they have been uſed in the ſtructure. They muſt never ſtand under any thing except ſuch ornaments as are placed at the very top.

(174.) Attics ſhould never exceed in height one third of the height of the order on which they are placed, nor be leſs than one quarter of it. The baſe, dye, and cornice, of which they are compoſed, may bear the ſame proportions to each other as thoſe of pedeſtals do; and the baſe and cornice may be compoſed of the ſame mouldings as thoſe pedeſtals. Sometimes the Attic is continued throughout; at others, it projects, and forms a pilaſter over each column of the order. The breadth of this pilaſter is ſeldom made narrower than the upper diameter of the column below it, and never broader. Its projection may be equal to one quarter of its breadth.

Sect. XIII. *Of* Orders upon Orders *and of* Baſements.

(175.) Having already deſcribed the regular ſucceſſion of orders that ſhould be obſerved, from the ground upwards; (ſee § 158, 159,) we have now only to obſerve, that in placing columns upon one another, the axis of every column ſhould be perpendicular to that of the other; at leaſt they muſt be ſo in the front view. With regard to the proportions of columns placed above each other, Scamozzi's rule, "that the lower diameter of the ſuperior column ought conſtantly to be equal to the upper diameter of the inferior," is univerſally eſteemed the beſt, and gives all the columns the appearance of one long tapering tree cut into ſo many pieces.

(176.) We have few examples, however, in this country, of more than two ſtories of columns in the ſame elevation; for when there are three, it is impoſſible to avoid ſome ſtriking inconſiſtencies, or to preſerve the character of each order in its intercolumnial decorations; ſince the intervals of the upper columns muſt become too wide, and would neither appear graceful nor ſolid.

(177.) Inſtead of employing ſeveral orders, one above another, the ground floor is, in ſome caſes, made in the form of a baſement, on which the order that decorates the principal ſtory is placed. The proportions of theſe baſements are not fixed, but depend on the nature of the rooms on the ground floor. In ſome ſtructures, the height of the baſement is equal to that of the firſt order. In ſome buildings it does not exceed two thirds of the order, and in others is only half its height. Baſements ſhould never be higher than the columns they ſupport, nor leſs than one half of their height.

(178.) Baſements are uſually decorated with ruſtics, whoſe height, including the joint, ſhould be half a diameter of the order placed upon them. Their figures are from a ſquare to a ſeſquialtera; and their joints may be either ſquare or chamfered. The ſquare joint is one eight of the height of the ruſtic, and in depth they are equal to their width; thoſe that are chamfered muſt form a rectangle; and their joints are one fourth of the width of the flat part of the ruſtic.

PART III.

OF THE OTHER NECESSARY OR ORNAMENTAL PARTS OF BUILDINGS.

Sect. I. *Of* Perſians, Caryatides, *and* Termini.

(179.) Along with columns and pilaſters, it is ſometimes cuſtomary to employ repreſentations of the human figure, to ſupport entablatures in buildings. The male figures are called *Perſians*; and the female, *Carians*, or *Caryatides*. See Pl. XXI.

(180.) The Perſians are ſo called from a victory gained over the Perſians by Pauſanias, who having brought home priſoners, ſpoils, and trophies to the Athenians, they fixed upon Perſian figures for thoſe which ſhould ſupport entablatures, and thus kept in mind that there were once Perſian ſlaves in Athens. To repreſent theſe conquered people in the loweſt ſtate poſſible, they loaded them with the heavieſt entablature, viz. that of the Doric Order. In proceſs of time, however, other figures beſides thoſe of Perſians were introduced, and other entablatures put over them; but the name was ſtill retained.

(181.) The proper Caryatides are women dreſſed in long robes, after the Aſiatic manner; and the origin of the device was as follows.—The Carians had been long at war with the Athenians; but being at length totally vanquiſhed, their wives were led away captives; and to perpetuate the memory of this event, trophies were erected, in which figures of women dreſſed in the Caryatic manner, were uſed to ſupport entablatures like the Perſians; and though other female figures were afterwards uſed in the ſame manner, the name of *Caryatides* was always retained.

(182.) The ancients made frequent uſe of Perſians and Caryatides, and delighted in diverſifying them a thouſand ways. The modern artiſts have followed their example; and there is a great variety of compoſitions of this kind to be met with in different parts of Europe. Indecent attitudes, diſtorted features, and all monſtrous productions, ought to be avoided, of which there are many examples in Gothic buildings. On the contrary, the attitudes ſhould be ſimple and graceful, the countenance always pleaſing, though varied and ſtrongly

ſtrongly marked agreeably to the nature of the object repreſented. See PLATE XXI.

(183.) The Caryatides ſhould never much exceed the human ſize. But the Perſians, or male figures, may be of any ſize; and the larger the better, as they will ſtrike the beholder with greater awe and aſtoniſhment. Perſians may be uſed with propriety in arſenals, galleries of armour, &c. under the figures of captives, heroic virtues, &c. Their entablature ought to be Doric, and bear the ſame proportion to them as to columns of the ſame height. The entablature for Caryatides ought to be either Ionic or Corinthian, according as the character of the figures is more or leſs delicate.

(184.) TERMINI are ſometimes employed, inſtead of Perſians or Caryatides, to ſupport the entablatures of monuments, chimney-pieces, and ſuch like compoſitions. Theſe figures owe their origin to the ſtones uſed by the ancients to mark the limits of particular poſſeſſions. Numa Pompilius, to render theſe inviolable, conſecrated the Terminus into a deity, and inſtituted feſtivals and ſacrifices to his honour. In a ſhort time, what was formerly only large upright ſtones, were repreſented in human ſhape, and afterwards introduced as ornaments to temples and other buildings. The termini are now principally uſed as ornaments for gardens and fields.

SECT. II. *Of* PEDIMENTS.

(185.) Among the Romans, Pediments were uſed only as coverings to their ſacred buildings, till Cæſar obtained leave to cover his houſe with a pointed roof, after the manner of temples. In the remains of antiquity we meet with two kinds of pediments, the triangular and the circular. The former of theſe are promiſcuouſly applied to cover ſmall or large bodies: but the latter, being of a heavier figure, are never uſed but as coverings to doors, niches, windows, or gates. As a pediment repreſents the roof, it ſhould never be employed but as a finiſhing to the whole compoſition.

(186.) The ancients introduced but few pediments into their buildings, uſually contenting themſelves with a ſingle one to adorn the middle or principal part. But ſome of the moderns, and particularly the Italians, have been ſo immoderately fond of them, that their buildings frequently conſiſt of ſcarcely any thing elſe.

(187.) The GIRDER being a neceſſary part in the conſtruction of a roof, it is an impropriety to intermit the horizontal entablature of a pediment, by which it is repreſented, to make room for a niche, an arch, or a window.

(188.) In regular architecture, no other form of pediments can be admitted beſides the TRIANGULAR and CIRCULAR. Both of them are beautiful; and when a conſiderable number of pediments are introduced, as when a range of windows are adorned with them, theſe two figures may be uſed alternately, as in the niches of the Pantheon, and in thoſe of the temple of Diana at Niſmes.

(189.) The proportion of pediments depends upon their ſize; for the ſame proportions will not ſuit in all caſes. When the baſe of the pediment is ſhort, its height muſt be increaſed; and when the pediment is long, the height muſt be diminiſhed. The beſt proportion for the height is from one fifth to one fourth of the baſe, according to the extent of the pediment, and the character of the body it covers. The materials of the roof muſt alſo be attended to; for if it be covered with tiles, it will be neceſſary to raiſe it more than one quarter of the baſe, as was the cuſtom of the ancients in their Tuſcan temples.

(190.) The TYMPAN is always on a line with the front of the frieze; and when large, admits of various ornaments.

SECT. III. *Of* GATES, DOORS, *and* PIERS.

(191.) There are two kinds of entrances, viz. DOORS and GATES. The former ſerve only for the paſſage of perſons on foot; but the latter likewiſe admit horſemen and carriages. Doors are uſed as entrances to churches and other public buildings, to common dwelling houſes and apartments: and gates ſerve for inlets to cities, fortreſſes, parks, gardens, palaces, &c. The apertures of gates being always wide, they are generally made in the form of an arch, that figure being the ſtrongeſt. But doors, which are generally of ſmall dimenſions, are commonly parallelograms, and cloſed horizontally. The general proportion for the apertures, both of gates and doors, whether arched or ſquare, is, that the height be about double the breadth.

(192.) The moſt common, and indeed almoſt the only ornaments for gates are the piers by which they are ſupported, and which were originally no more than bare poſts into which the hinges of the gate were driven. Though this, however, is the only proper uſe of piers, it muſt be concealed as much as poſſible, and they muſt ſeem as if placed there only for ornament. (See Pl. XX.) As they are to be fixed to the wall before the houſe, ſo they muſt be proportioned to it; and as they are to be ſeen in the ſame view with the front of the houſe, their correſpondence with it is equally neceſſary. They are to be placed on a plinth, and ſomething muſt be allowed by way of ornament and finiſhing at the top.

(193.) All the luxuriance of fancy may be employed in the decoration of piers: but it will be proper to obſerve this general rule, that the pier being an inferior building, it muſt never be richer than the front of the houſe. If, for inſtance, the front of the houſe is ornamented with columns of the Doric order, the Ionic muſt not be uſed in the piers; and it will be found better to omit columns altogether, than to make uſe of the Tuſcan order for piers in any caſe. If the Ionic or Corinthian orders are employed in the front of the houſe, the Doric or Ionic may be uſed with propriety in the piers. One piece of ornament is almoſt univerſal in piers, namely, a niche with its ſeat, made as if for the convenience of weary travellers. On this account, it will be proper to raiſe the columns on pedeſtals, becauſe the continued moulding from their cap will be a good ornament under the niche. The baſe of the columns ought always to be Attic.

(194.) Inſide doors, however ſmall the building

may be, ſhould never be narrower than 2 feet 9 inches; nor ſhould they ever, in private houſes, exceed 3 feet 6 inches in breadth, which is more than ſufficient to admit the bulkieſt perſon. Their height ſhould at leaſt be 6 feet 3 or 4 inches; otherwiſe a tall perſon cannot paſs without ſtooping. In churches, palaces, &c. where there is a conſtant ingreſs and egreſs of people, the apertures muſt be larger. The ſmalleſt breadth that can be given to a gate is 8½ or 9 feet, which is but juſt ſufficient for the paſſage of a coach.

SECT. IV. *Of* NICHES *and* STATUES.

(195.) In every age almoſt, ſince architecture became improved, it has been cuſtomary to enrich different parts of buildings with repreſentations of the human body. Thus the ancients adorned their temples, baths, theatres, &c. with ſtatues of their deities, heroes, and legiſlators.—The moderns ſtill preſerve the ſame cuſtom, placing in their churches, palaces, &c. ſtatues of illuſtrious perſons, and even groups compoſed of various figures, repreſenting occurrences collected from hiſtory, fables, &c. Sometimes theſe ſtatues or groups are detached, raiſed on pedeſtals, and placed contiguous to the walls of a building, or in the middle of a room, court, or public ſquare. But they are moſt frequently placed in cavities made in the walls, called *niches*.

(196.) There are two ſorts of NICHES; the one formed like an arch in its elevation, and ſemicircular or ſemielliptical in its plan; the other is a parallelogram both in its plan and elevation.—The proportion of both theſe depends on the characters of the ſtatues, or the general form of the groups placed in them. The loweſt are at leaſt a double ſquare in height; and the higheſt never exceed 2½ of their breadth.

(197.) When niches are alone in a compoſition, they are generally incloſed in a pannel, formed and proportioned like the aperture of a window, and adorned in the ſame manner. In this caſe the niche is carried quite down to the bottom; but on the ſides and at the top, a ſmall ſpace is left between the niche and the architrave of the pannel. And when niches are intermixed with windows, they may be adorned in the ſame manner with the windows, provided the ornaments be of the ſame figure and dimenſions with thoſe of the windows.

(198.) The ſize of the ſtatues depends on the dimenſions of the niches. They ſhould neither be ſo large as to have the appearance of being rammed into the niches, as in Santa Maria Majora at Rome; nor ſo ſmall as to ſeem loſt in them, as in the Pantheon. The diſtance between the outline of the ſtatue and ſide of the niche ſhould never be leſs than one third of a head, nor more than one half, whether the niche be ſquare or arched; and when it is ſquare, the diſtance from the top of the head to the cieling of the niche ſhould not be greater than the diſtance on the ſides.

(199.) Statues are generally raiſed on a plinth, the height of which may be from one third to one half of a head; and ſometimes where the niches are large, the ſtatues may be raiſed on ſmall pedeſtals. The character of the ſtatue ſhould always correſpond with the character of the architecture with which it is ſurrounded. If the order be Doric, Hercules, Jupiter, Mars, Æſculapius, and all male ſtatues, repreſenting beings of a robuſt and grave nature, may be introduced; if Ionic, then Apollo, Bacchus, &c.; and if Corinthian, Venus, Flora, and others of a delicate nature ſhould be employed.

SECT. V. *Of* CHIMNEY-PIECES.

(200.) Among the ancients there are very few examples of chimney-pieces to be met with. Neither the Italians nor French have excelled in compoſitions of this kind: But Britain, poſſeſſed of many able ſculptors at different times, has occaſionally ſurpaſſed all other nations, both in taſte of deſign and workmanſhip. The ſize of the chimney muſt be regulated by the dimenſions of the room where it is placed. In the ſmalleſt apartments, the breadth of the aperture ſhould never be leſs than 3 feet, or 3 feet 6 inches. In rooms from 20 to 24 feet ſquare, or of equal ſuperficial dimenſions, it may be from 4 to 4½ feet broad; in thoſe of 24 to 27, from 4½ to 5; and in ſuch as exceed theſe dimenſions, the aperture may even be extended to 5½ or 6 feet.

(201.) The chimney ſhould always be ſituated ſo as to be immediately ſeen by thoſe who enter the room. The middle of the partition wall is the moſt proper place in halls, ſaloons, and other rooms of paſſage; but in drawing-rooms, dreſſing-rooms, and the like, the middle of the back wall is the beſt ſituation. In bed-rooms, the chimney is always in the middle of one of the partition walls: and in cloſets and other very ſmall places, to ſave room, it is put in a corner.

(202.) Wherever two chimneys are uſed in the ſame room, they ſhould be placed either directly facing each other, if in different walls, or at equal diſtances from the centre of the wall in which they both are. The proportion of the apertures of chimney-pieces of a moderate ſize is generally a perfect ſquare; in ſmall ones it is a trifle higher; and in large ones, a trifle lower.

(203.) The ornaments of chimney-pieces conſiſt in architraves, friezes, cornices, columns, pilaſters, termini, caryatides, conſoles, and all kinds of ornaments of ſculptor, repreſenting animals and vegetables, &c. likewiſe vaſes, chalices, trophies of arms, &c. In deſigning them regard muſt be had to the nature of the place where they are to be employed. Such as are intended for halls, ſaloons, guard-rooms, galleries, and other large places muſt be compoſed of large parts, few in number, of diſtinct and ſimple forms, and having a bold relief; but chimney-pieces for drawing-rooms, dreſſing-rooms, &c. may be of a more delicate and complicated nature.

SECT. VI. *Of* STAIR-CASES, *and* HAND RAILS.

(204.) STAIR-CASES ought to be ſo conſtructed as to make the aſcent ſafe, agreeable, and eaſy.—To fix on a proper and advantageous ſituation, for a ſtair-caſe is often attended with difficulty; but without this the internal convenience and beauty of a houſe will be much injured. Palladio is of opinion, that the entrance to a ſtair-caſe ought to be ſituated, ſo as the principal parts of a building may be ſeen before we aſcend the ſteps and

and upon this principle it is obſervable, that a more eaſy acceſs is gained to the principal apartments on the ground floor.

(205.) To render ſtairs eaſy of aſcent, the height of a ſtep ought not to exceed 7 inches, nor in any caſe to be leſs than 4, but ſix inches is a general height. The breadth of the ſteps ſhould not be leſs than 12 inches, if it can poſſibly be avoided: nor ſhould they ever be more than 18; and to render our aſcent free from the interruption of perſons deſcending, their length ſhould not exceed 12, nor be leſs than 4 feet, except in common and ſmall buildings, whoſe area will not admit of a ſtair caſe of more than 3 feet. That the aſcent may be both ſafe and agreeable, it is requiſite alſo to introduce ſome convenient aperture for light, which ought to be as nearly oppoſite to our firſt entrance to the ſtairs, as the nature of the building will admit of. An equal diſtribution of light to each flight of ſtairs ought to be particularly regarded; for which reaſon, theſe apertures or windows are commonly placed at the landings or half ſpaces; though ſometimes the whole is lighted from a dome.

(206.) Stair caſes whoſe plans are circular, are of various kinds. Some wind round a newel or column, in the middle, and the riſers of the ſteps are ſtraight, and ſometimes curved. Others form a well or void ſpace, in the centre. The ſame may be obſerved of thoſe whoſe plans are elliptical: the moſt common however, are thoſe whoſe plans are a ſquare or parallelogram. The ancients paid a ſuperſtitious regard to an odd number in their flights of ſteps; as 3, 5, 7, &c. in order that in their aſcent, they might begin and finiſh with the right foot. Palladio therefore, allows to the ſtair-caſe of a dwelling-houſe, 11 or 13 ſteps to each flight.

(207.) When a ſtair-caſe winds round a newel, whether its plan be circular or elliptical, the diameter being divided into three equal parts, two are ſet apart for the ſteps, and one for the column. But in circular or elliptical ſtair-caſes that are open, or which form a well in the middle, the diameter is divided into four equal parts; two for the ſteps, and two for the void ſpace in the centre. Modern ſtair-caſes however, have often a kind of well of a mixed form: ſtraight on each ſide, and circular at the returns of each flight. The openings of theſe wells are various in wideneſs, but ſeldom exceeds 18 or 20 inches.

(208.) Moſt ſtair-caſes, both for convenience and ornament, ought to have HAND RAILS. Theſe generally begin from the ground by a twiſted ſcroll, which, when ſkilfully managed, produces a very good effect. To aſſiſt in the conſtruction of theſe, we ſhall offer the following obſervations, as illuſtrated by the various figures in *Plate* XXIII. In figure 1, we have the plan of the firſt ſtep, formed with a ſcroll to receive the newel poſt and balluſters of the twiſted hand-rail: *a* is the projecting noſing of the ſtep; *b* the thickneſs of the bracket, and *c* the ſtring board. To draw the ſcroll proceed thus: Let the ſpace 1, 3, in *fig.* 1, be conſidered as equal to the ſpring of the ſcroll from its centre to the ſtraight part of the hand rail, as from O to 1, *fig.* 3. Divide 1, 3, into three equal parts; and drawing the line 4, 3, at right angles to 1, 3, make it equal to one more of theſe parts. Draw then the diagonal 4, 1; and from the centre 4, deſcribe the arch 3, 5. Divide the arch into 12 equal parts; and through theſe diviſions, draw the radii till they interſect the line 3, 1, as at 2, 3, 5, &c. which completes the ſcale for drawing the ſcroll. Suppoſing that the ſeveral radial lines; 1, 2, 3, 4, &c. in *fig.* 3. are already drawn, proceed thus: Take from *fig.* 2 the ſpace 3, 2, and place it at *fig.* 3, from the centre O to 2. On 2 with the ſame opening, fix one foot of the compaſſes, and with the other ſtrike a ſhort curve line, as at C, and from 1 with this opening, deſcribe another, interſecting it at C. From the centre C thus found, draw the arch, 2, 1. Again, from *fig.* 2 take the ſpace 3 3, and place it from O on the radial 3: with this opening, find the centre as before, and draw the arch 3, 2, proceeding in the ſame way with the reſt. By contracting the line 4, 3, in *fig.* 2, it is evident, that a ſcroll may be drawn more open, or with leſs convolution, as in *fig.* 4; conſequently, by increaſing the length 4, 3, the ſcroll will acquire more convulution; and therefore we may, by theſe means, vary the ſcroll as we pleaſe. In *fig.* 5, is ſhewn the pitchboard or raking of the ſteps, in order to determine the falling mould of the twiſt. The dotted lines drawn from the hand rail to the pitchboard, ſhew its width, which is to be kept level, as it winds about. The lines *a*, 3, *b*, 2, continued round to D, ſhew how much half the width of the rail riſes on the pitchboard, from its beginning to 3. D exhibits the ſame pitchboard; and the method of finding the outſide mould for the twiſt of the hand rail, after its ſides are ſo ſquared as to be every way in a perpendicular direction to its ground plan. But this cannot be done without firſt finding the mould for the hand-rail, which may be done thus: Conſider B in *fig.* 6, as that part of the plan of the hand-rail, comprehended between 1, 3, *fig.* 5. D is the pitch-board, which gives the rake or bevel of the hand rail; which, being divided into any number of equal parts, draw ordinates to the plan B, as *a*, *b*. From the raking lines, *c*, *d*, draw the correſponding ordinates at right angles with it; and by the two compaſſes transfer the ſeveral ordinates from 3 to G, as *a*, *b*, to *c*, *d*, and 1, 2, 3, 4, reſpectively: then, by drawing a curve line through theſe points, G will become an accurate mould for the upper ſide of the hand rail.

(209.) As however the twiſt of the hand rail requires a greater ſubſtance of wood than the ſtraight part, this may eaſily be determined thus: Draw the ſquare of the hand rail on the pitch-board, as *a* in fig. 7; and parallel lines from the oppoſite angles will ſhew the thickneſs required, as at 1, 2. Agreeable to this, *l*, *m*, *n*, in fig. 8, ſhew the manner of glewing the rail with the additional thickneſs of wood before deſcribed. It is made of ſo many pieces, and varied in glewing, to aſſiſt in more eaſily forming the twiſt. The beſt method, in fact, is to glew theſe in the ſtraight way of the grain, by which, if the wood be properly matched, the whole will appear one ſolid piece. To reduce theſe pieces properly, and to produce in the whole twiſt an agreeable turn, it will be requiſite

to

to have a falling mould, that when each part of the twiſt is ſo ſquared, as in every part to anſwer to a perpendicular line over its plan when placed in its due poſition, it may be applied to the outſide of the rail round the twiſt.

(210.) In *fig.* 5, therefore, conſider D the pitch board and O P the level of the ſcroll at 3, 4. Take the ſtretch of a line ſuppoſed to be girted from 1 to 3, which tranſfer to O P at D. Divide each ſide of the angles formed by the raking and level line into any number of equal parts, as 1, 2, 3, each way, and the points produced by the interſections of the lines drawn from each diviſion, will form a curve, perfectly eaſy and ſufficiently accurate for the purpoſe.

(211.) If a ſcroll is required to take its ſpring from any part of the ſecond ſtep, then draw the pitch-board as at *fig.* 6, and proceed in every particular as before. *Fig.* 9, is a plan of the hand rail, including ſteps, as in cylindrical ſtair-caſes. M is the quarter plan, and D is the pitch of 5 ſteps; and R the face mould for the hand rail if it be cut out of the ſolid; if otherwiſe, thin veneers are glewed round a cylinder made for the purpoſe, and on which muſt be marked each ſtep and riſer as ſhewn at A, that the thin ſlips at *b* for the hand rail, and thoſe at *a* for the ſtringing board, may be correctly laid down.

SECT. VII. *Of* BALLUSTRADES.

(212.) Balluſtrades are ſometimes of real uſe in buildings; and at other times they are only ornamental. Such as are intended for uſe, as when they are employed in ſtair-caſes, before windows, or to incloſe terraces, &c. muſt always be nearly of the ſame height; never exceeding 3 feet and a half, nor ever leſs than 3. But thoſe that are principally deſigned for ornament, as when they finiſh a building, ſhould be proportioned to the architecture they accompany; and their height ought never to exceed 4 fifths of the height of the entablature on which they are placed: nor ſhould it ever be leſs than 2 thirds thereof, without counting the zocholo, or plinth, the height of which muſt be ſufficient to leave the whole balluſtrade expoſed to view.

(213.) The beſt method to proportion baluſtrades is to divide the whole given height into 13 equal parts; 8 of theſe for the height of the balluſter, 3 for the baſe, and 2 for the cornice or rail; or into 14 (if it be required to make the balluſter leſs,) giving 8 parts to the balluſter, 4 to the baſe, and 2 to the rail. One of theſe parts may be called a *module*; and being divided into 9 minutes, may ſerve to determine the dimenſions of the particular members. The diſtance between 2 balluſters ſhould not exceed half the diameter of the balluſter meaſured in its thickeſt part, nor be leſs than one third of it.

(214.) The breadth of the pedeſtals, when they are placed on columns or pilaſters, is regulated by them; the dye never being made broader than the top of the ſhaft, nor much narrower; and when there are neither columns nor pilaſters on the front, the dye ſhould not be much lower than a ſquare, and ſeldom higher. On ſtairs, or other inclined planes, the ſame proportions are to be obſerved as on horizontal ones.

SECT. VIII. *Of* ROOFS.

(215.) A plan of the building to be covered ſhould be made, before we begin to the operation of roofing, that we may be able to aſcertain the lengths of the various timbers required for the whole. The particular kinds of covering practiſed in England are lead, pantiles, plain tiles, and ſlates. Coverings of lead are doubtleſs the beſt and moſt durable of any other; but on account of their expence they are ſeldom choſen, except for magnificent buildings. Lead is now moſt generally uſed on roofs nearly or perfectly flat, where any other ſort of covering would not be ſafe. The pitch or perpendicular height of ſuch roof is about two 9ths of the width of the building, or rather under what is termed pediment pitch. Pantile coverings may alſo be uſed to low roofs; but their general pitch ought to be about three 8ths of the width of the building. Coverings of plain tiles and ſlates are generally allowed the higheſt pitch; becauſe when they are laid on low roofs, the rain will more eaſily find its way between them. Theſe ought to have a pitch, the length of whoſe rafters is three 4ths of their girder; or at leaſt, the ſides of the roof ought to be at right angles with each other.

(216.) There are alſo various kinds of circular roofs; but thoſe moſt generally uſed are formed in the manner now deſcribed, having ſquare or oblong plans, and timber frames, as in figures 7 and 8, in Plate XXIII. whoſe principal parts are thus named: A is the beam or girder; B, the principal rafter or ſuſpar; C, the king poſt; DD, the ſtruts. Fig. 1. is a truſſed roof, with 3 king poſts, capable of bearing 70 feet ſpan. Fig. 2. is an M roof, capable of ſupporting the ſame extent. Such roofs are uſeful in caſes where the ſpan is extenſive, and when the pitch is required to be low. This however ſeldom happens in practice; for if there be a middle wall, the roof is made double, as in fig. 9. Fig. 4, 4, ſhews the method of piercing timber, and ſecuring it by bolt: Fig. 5, the method of truſſing a girder with pieces, *a*, *b*; Fig. 6, of truſſing a partition.

(217.) Beams that exceed 20 feet in extent, ſhould be truſſed in one or more places, as may be required. Beams ſhould never exceed 15 feet in bearing; nor rafters more than 10 feet; and eſpecially in roofs of very low pitch, whoſe coverings have a much greater preſſure on their rafters, than thoſe of higher pitches, and which may therefore exceed 10 feet.

(218.) If the length of a beam of fir be 30 feet, its ſcantlings may be 7 inches deep and 6 inches thick:—

If 45,	9	inches deep and	7	inches thick.
60,	10	———	8½	———
75,	10½	———	10	———
90,	12	———	10½	———

(219.) If the length of a principal rafter be 24 feet, its ſcantlings may be 6 inches deep and 5 in thickneſs:—

If 36,	7	inches deep and	6	in thickneſs.
41,	9	———	7	———
60,	10	———	7½	———
72,	10	———	9	———

(220.) Rafters of theſe dimenſions are generally made

made about one inch larger at the bottom of both in depth and thickneſs; which ſtrengthens the roof by admitting larger tenons into the principal beams, and by becoming lighter at the top.

(221.) If the rafters be ſmall, as 8 feet in length, their ſcantlings may be $4\frac{1}{2}$ inches by 3 inches thick:

If 10, 5 —— 3 ——
12, 6 —— 3 ——

SECT. IX. *Of* CIELINGS.

(222.) Ceilings in churches and temples may be conſidered as the interior coverings of their roofs, as there is nothing between them but the neceſſary framing by which the whole is ſupported. For dwelling houſes the ſimpleſt and moſt common ſort are thoſe which are flat. Theſe are generally adorned with principal compartments, ſurrounded with mouldings, either let into the ceiling or projecting from it. Their ornaments and mouldings do not require a bold relief; but being near the eye, they muſt be finiſhed with neatneſs and taſte.

(223.) Coved cielings are certainly much more beautiful than flat ones; but their execution is attended with more expence. They are uſed promiſcuouſly in large and ſmall rooms, and occupy from one fifth to one third of the height of the room. But where the architect is at liberty to proportion the height of the room to its ſuperficial dimenſions, the moſt eligible proportion for the cove is one fourth of the whole height of the room. The figure of the cove is commonly either a quadrant of a circle or of an ellipſis, taking its riſe a little above the cornice, and finiſhing at the border round the great pannel in the centre. The border projects ſomewhat beyond the coves on the outſide; and on the ſide towards the pannel, it is generally made of ſufficient depth to admit the ornaments of an architrave.

(224.) When the profiles of rooms are gilt, the cielings ought likewiſe to be gilt. The uſual method is to gild all the ornaments, and leave the ground white, pearl-colour, light blue, or any other that may be proper to ſet off the gilding to advantage.

(225.) Hiſtorical and other paintings are often introduced with good effect in the centre and angular compartments of large ceilings; and of late an invention of painted ſilk and ſattin in various ornaments from the antique, has been introduced, to adorn the profiles of walls of rooms. Theſe are incloſed in pannels, pilaſtres, and tablets, according to their ſituation; and, when they have ſuitable gilt mouldings, produce a very pleaſing and ſplendid effect.

PART IV.

OF THE ERECTION OF BUILDINGS IN GENERAL.

SECT. I. *Of the* PRINCIPLES *to be obſerved in* ERECTING BUILDINGS.

(226.) THE rules of building require, that in every fabric, there ſhould be ſolidity, convenience and beauty; to which, according to ſome of the moſt refined maſters, are added, order, diſpoſition, proportion, decorum, and economy. Theſe 8 particulars are conſidered by the moſt ſkilful architects as abſolutely neceſſary in the planning, erecting, and finiſhing an entire fabric.

(227.) Solidity implies the choice of a good foundation and proper materials to work with, as well as their judicious application. Convenience demands ſuch a diſpoſition of the various parts of a ſtructure, that they may not crowd and embarraſs each other, to appear diſagreeable to a ſpectator. Of beauty we already have treated. Order gives each part of the building a proportionate extent; ſuch as is adapted to the magnitude of the whole. Diſpoſition is the due ranging and agreeable union of all the parts, including a proper and convenient arrangement of the various apartments of the whole fabric. Proportion is the relation that the whole work has to its conſtituent parts, and which each part has to the complete idea of the whole; for in buildings that are perfect in their kind, from any particular part we may form a tolerable judgment of the whole. Decorum conſiſts in making the whole aſpect of the fabric ſo correct, that nothing ſhall appear, but what is founded in the principles of reaſon, geometry, and delicacy of judgment. It includes deſign, or the choice of one ſituation in preference to another, which we may conceive improper for the kind of building we are about to erect; and directs us to pitch upon different proſpects or views for different parts of an edifice. Oeconomy inſtructs the architect to have regard to the expence of his whole deſign, which will be greatly effected by a choice of ſuch materials, as are not only proper for this purpoſe, but of the cheapeſt of the kind which are proper.

SECT. II. *Of* FOUNDATIONS.

(228.) The beſt foundation is that which conſiſts of gravel or ſtone; but in order to know whether the inferior ſtrata are ſufficient for the ſupport of the building, it will be adviſable to ſink wells at ſome little diſtance. By attending to what is thrown up in the digging theſe, the architect will be acquainted with what lies under the ſtony or gravelly bed which on the ſurface promiſes ſo much ſecurity, and will know what meaſures to take.

(229.) But though a ſtony or gravelly bottom is undoubtedly the moſt ſure and firm, where all is ſound beneath, there is no kind of ground which may prove more fallacious, or occaſion ſuch terrible accidents. The reaſon is, that ſuch ground often contains abſolute vacuities; nor is rock itſelf, though a foundation upon a rock is ſtrong even to a proverb, free from danger of the ſame kind. Caverns are very frequent in rocky places; and ſhould an heavy building be erected over one of theſe, it might ſuddenly fall down altogether.

(230.) To guard againſt accidents of this kind, Palladio adviſes the throwing down great weights forcibly on the ground, and obſerving whether it ſounds hollow, or ſhakes. He ſays, if a drum be placed on the ſuſpected ground near to a veſſel filled with water, a gentle ſtroke will not refound nor ruffle the ſurface of the water, if the earth be ſolid; but, if it be hollow, the effects produced will very clearly ſhew it.

(231.) Where the foundation is gravel, it will be proper to examine the thickneſs of the ſtratum,

and the qualities of thoſe that lie under it, as they have appeared in digging. If the bed of gravel is thick, and the under ſtrata of a ſound and firm kind, there needs no aſſiſtance; if otherwiſe, we muſt have recourſe to various methods in order to ſupply the defect. In caſe of boggy earths, or unfirm ſand, piling is one of the moſt common methods of ſecuring a foundation; and, notwithſtanding the natural diſadvantages in ſuch a caſe, piles, when properly executed, make one of the firmeſt and moſt ſecure foundations.

(232.) In foundations near the edge of waters, we ſhould always ſound to the very bottom, as many fatal accidents have happened from the ground being undermined by rivers. The ſame method is to be followed when the ground on which we build has been dug or wrought before. It ought never to be truſted in the condition in which it is left; but we muſt dig through it into the ſolid and unmoved ground, and ſome way even into that, according to the weight and ſize of the intended edifice.

(233.) It will be proper, however, before the architect begins to lay the foundation of the building, to contruct ſuch drains as may be neceſſary for carrying off the rain, or other water, that would otherwiſe be collected and lodge about the houſe. In forming drains for carrying off this water, it will be neceſſary to make large allowance for the different quantities that may be collected at different times. It muſt alſo be conſidered, that water of this kind is always loaded with a vaſt quantity of ſediment, which by continually falling to the bottom will be very apt to choak up the drain, eſpecially at thoſe places where there happen to be angles or corners in its courſe. The only method of preventing this is by means of certain cavities diſpoſed at proper diſtances from one another. Into theſe the ſediment will be collected, and they are for that reaſon called *ſeſs-pools*.

(234.) All drains ought to be arched over at top, and may be moſt conveniently built of brick. According to their different ſizes, the following proportions of height and thickneſs may be obſerved. If the drain is 18 inches wide, the height of the walls may be one foot, and their thickneſs 9 inches; the bottom may be paved with brick laid flatwiſe, and the arch turned 4 inches. If the drain be 22 inches wide, the ſide walls are then to be one foot three inches in height, and the reſt conſtructed as before. If it be 14 inches wide, the height of the walls may be 9 inches, and the ſweep of the arch 4. A drain of a yard wide ſhould have the ſame height, and the arch turned over it ought to be 9 inches thick. Upon the ſame principles and proportions may other drains of any ſize be conſtructed.

(235.) The ſewers and drains being conſtructed in a manner to the proportioned ſize of the intended building, the architect may next proceed to lay the foundation of the walls. Here his firſt care muſt be, that the floor of the foundation be perfectly ſmooth and level. The Italians begin with laying over it an even covering of ſtrong oak plank; and upon that they lay, with the moſt exact care, the firſt courſe of the materials. Whether we take this method, or begin upon the naked floor, all muſt be laid with the utmoſt accuracy by rule and line. When the board plat is laid, a courſe of ſtone is the beſt firſt bed, and this is to be laid without mortar; for lime would make the wood decay, which otherwiſe, in a tolerably good ſoil, will laſt for ages.

(236.) The thickneſs of foundation walls, in general, ought to be double that of the walls which they are to ſupport. The looſer the ground, the thicker the foundation wall ought to be; and it will require the ſame addition alſo in proportion to what is to be raiſed upon it. The plane of the ground muſt be perfectly level, that the weight may preſs equally every where: for when it inclines more to one ſide than the other, the wall will ſplit. The foundations muſt diminiſh as they riſe, but the perpendicular is to be exactly kept in the upper and lower parts of the wall; and this caution ought to be obſerved all the way up with the ſame ſtrictneſs. In ſome ground, the foundation may be arched; which will ſave materials and labour, at the ſame time that the ſuperſtructure has an equal ſecurity. This practice is peculiarly ſerviceable where the foundation is piled.

Sect. III. *Of* Walls, Chimneys, Roofs, *and* Floors.

(237.) As the foundation walls are to diminiſh in thickneſs, ſo are thoſe alſo which are built upon them. This is neceſſary to ſave expence, but is not abſolutely ſo to ſtrengthen the wall; for it would be no leſs ſtrong, though it were continued all the way to the top of an equal thickneſs, provided the perpendicular was exactly kept. In common houſes built of brick, the general diminution from the bottom to the top is one half the thickneſs at the bottom; the beginning is two bricks, then a brick and a half, and laſtly one brick in thickneſs. In larger edifices, the walls muſt be made proportionally thicker; but the diminution is preſerved much in the ſame manner. When ſtones are uſed, regard muſt be had to their nature, and the propriety of their figures for holding one another; and where the wall is to be compoſed of different materials, as ſtone and brick, the heavieſt ought always to be placed undermoſt.

(238.) One additional particular reſpecting the ſtrength of a plain wall muſt be obſerved, viz. to fortify its angles. This is beſt done with good ſtone on each ſide, which gives not only a great deal of ſtrength, but a great deal of beauty. Pilaſters properly applied afford great ſtrength to walls. Their beſt diſtance is about every 20 feet, and they ſhould riſe five or ſix inches from the naked of the wall. The openings in a wall are all weakeners, and as the corners require to be the ſtrongeſt parts, there ſhould never be a window very near a corner. Properly, there ſhould always be the breadth of the opening firm to the corner.

(239.) Along with the conſtruction of walls, that of the chimneys muſt alſo be conſidered; for errors in the conſtruction of theſe will render the moſt elegant buildings extremely diſagreeable. The common cauſes of SMOKING are either that the wind is too much let in above at the mouth of the ſhaft, or the ſmoke is ſtifled below: and ſometimes a higher building, or a great elevation of the ground behind, is the ſource of the miſchief; or laſtly, the room in which the chimney is may be

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ſo ſmall or cloſe, that there is not a ſufficient current of air to drive up the ſmoke. Almoſt all that can be done, while the walls are conſtructing, to prevent ſmoke, is, to make the chimney vent narrower at bottom than at top: yet this muſt not be carried to an extreme; becauſe the ſmoke will then linger in the upper part, and all the force of the draught will not be able to ſend it up.—For curing ſmoky chimneys in houſes already built, ſee CHIMNEY.

(240.) After the walls are finiſhed, the roof is the next conſideration: but concerning it very little can be ſaid, only that its weight muſt be proportioned to the ſtrength of the walls. It muſt be ſo contrived as to preſs equally upon the building and the inner walls muſt bear their ſhare of the load as well as the outer ones. A roof ought neither to be too maſſy nor too light; as being neceſſary for keeping the walls together by its preſſure, which it is incapable of doing while too light; and if too heavy, it is in danger of throwing them down. Of theſe two extremes, however, the laſt is to be accounted the worſt.

(241.) Floors are moſt commonly made of wood; in which caſe, it is neceſſary that it be well ſeaſoned by being kept a conſiderable time before it is uſed. The floors of the ſame ſtorey ſhould be all perfectly on a level; not even a threſhold riſing above the reſt: and if in any part there is a room or cloſet whoſe floor is not perfectly level, it ought not to be left ſo, but raiſed to an equality with the reſt; what is wanting of the true floor being ſupplied by a falſe one.

(242.) The floors of low houſes may be made of clay, ox blood, and a moderate portion of ſharp ſand. Theſe three ingredients, beaten thoroughly together and well ſpread, make a firm good floor, and of a beautiful colour. In elegant houſes, the floors of this kind are made of Paris plaſter, beaten and ſifted, and mixed with other ingredients. This may be coloured to any hue by the addition of proper ſubſtances; and, when well worked and laid, makes a very beautiful floor. Beſides theſe, halls, and ſome other good rooms, are paved or floored with marble or ſtone; and this either plain or doted, or of a variety of colours: but the univerſal practice of carpeting has in a great meaſure ſet aſide ornamental work upon floors. In country buildings, alſo, floors are frequently made of bricks and tiles. Theſe, according to their ſhapes, may be laid in a variety of figures; and they are alſo capable of ſome variation in colour, according to the nature of the earth from which they are made. They may be laid at any time; but thoſe of earth or plaſter, are beſt made in the beginning of ſummer, for the ſake of drying.

SECT. IV. *Of the* DISTRIBUTION *of the* APARTMENTS *of* HOUSES, &c.

(243.) The diſtribution of the apartments of houſes muſt of neceſſity be directed by the way of life in which the inhabitants are engaged. In the country, this is commonly farming; and therefore beſides the houſe for the family, there is alſo neceſſary a barn for the reception of the produce of the ground, a ſtable for cattle, a cart houſe for keeping the utenſils under cover, and ſheds for other uſes.

(244.) To accompliſh theſe purpoſes, let a piece of ground be taken of five times the extent of the front of the houſe, and incloſed in the leaſt expenſive manner. Back in the centre of this let the houſe be placed, and in the front of the ground the barn and the ſtable, with the adjoining ſheds. Theſe are to be ſet, one on each ſide, to the extreme meaſure of the incloſed ground; they will thus fill up a part of the entrance, and will leave all about the houſe ſome incloſed ground by way of yard. From the barn to the ſtable may be extended a fence with a gate in the middle, and this gate ought to front the door of the houſe.

(245.) The plan of the houſe and out buildings may be made as follows. The door may open into a plain brick paſſage, at the end of which may be carried up a ſmall ſtair-caſe. On one ſide of the paſſage may be a common kitchen; and on the other a large room, which will ſerve the family by way of parlour. Beyond this may ſtand on one ſide the pantry, and on the other the dairy room, the laſt being twice the ſize of the former. They are placed on the ſame ſide with the parlour, on account of the heat of the kitchen, which renders it improper to be near them. On the kitchen ſide, a brew houſe may very conveniently be placed. More rooms may be added on the ground floor as occaſion requires; and the upper ſtorey ſhould be divided into bed chambers for the family, with garrets over them for the ſervants.

(246.) A gentleman's country ſeat muſt be built on a more elegant plan. Here the front may extend 65 feet in length, the depth in the centre being 40 feet, and in each of the wings 45. The offices may be diſpoſed in wings; the kitchen in the one, and the ſtables in the other: both of which, however, may correſpond in their front with the reſt of the building, which they ought alſo to do with one another. Theſe wings may have a projection of 13 feet from the dwelling houſe, to which they ought to be connected, not by ſtraight lines, but by curves. The beſt proportion of theſe offices to a houſe extending 65 feet in front, is 35 feet. If they are ſmaller the houſe will look gigantic; if larger they will leſſen its aſpect. To a front of 35 feet, a depth of 48 is a very good proportion.

(247.) There ought alſo to be a covered communication between the dwelling houſe and offices, which ſhould not appear to be a plain blank wall, but ought to be ornamented with gates. The arch by which the offices are joined to the dwelling houſe muſt be proportioned to the extent of the building and there cannot be a better proportion than five feet within the angles of the buildings. The wings which have only a projection of 13 feet, will appear to have one of 18, and the light will be agreeably broken.

(248.) As to the internal diſtribution of a houſe of this kind, the under ſtorey may be conveniently divided into 3 rooms. The hall, which is in the centre will occupy the whole of the projecting part, having a room on each ſide. The length of the hall muſt be 24 feet, and its breadth 12: the rooms on each ſide of it muſt be 16 feet long, and

11 wide. Of these two front rooms, that on the right hand may be conveniently made a waiting room for persons of better rank, and that on the left hand a dressing room for the master of the house. Behind the hall may run a passage of 4 feet and an half, leading to the apartments in the hinder part of the house and the stair-case. These may be disposed as follows. Directly behind the hall and this passage the space may be occupied by a saloon, whose length is 24 feet and its breadth 17. On the left hand of the passage, behind the hall, is to be placed the grand stair case; and as it will not fill the whole depth, a pleasant common parlour may terminate on that side of the house. On the other side, the passage is to lead to the door of the great dining parlour, which may occupy the whole space.

(249.) The wing on the right hand may contain the kitchen and offices belonging to it, and the other the stables. The front of the right hand wing may be occupied by a kitchen entirely, which will then be 30 feet long and 16½ wide, or it may be made smaller, by setting off a small room to the right. Twenty two feet by 16 will then be a good bigness. The other room will then have the same depth of 16 feet, and the width to the front may be 7½. Beyond the kitchen may stand the stair-case, for which 7½ feet will be a proper allowance; and to the right of this may be a scullery 11 feet 10 inches deep from the back front by 7 in breadth. To the left of the stair may be a servant's hall 16 feet square, and behind that a larder 12 feet 10 by 14 feet 6. In the centre of the other wing may be a double coach house: for which there should be allowed the whole breadth of the wing, with 10 feet 6 inches in the clear; and on each side of this may be the stables.

PART V.

OF AQUATIC ARCHITECTURE.

Sect. I. *Of* Stone Bridges.

(250.) Bridges generally form the continuation of a street or highway, over a river, canal, brook or marshy ground: and sometimes over dry ground, to form a connected street, (such as the N. and S. Bridges of Edinburgh,) between two rising grounds. Bridges that are merely a part of a high road, are built in a rude and cheap manner; but when they take their direction from a principal street in a capital city, their construction is attended with great expence: and a degree of elegance and durability is required in their formation, that calls for the utmost skill and ingenuity of the architect.

(251.) Palladio in his 3d book, tells us, that bridges ought to have the same qualifications that are judged necessary in all other buildings, namely, that they should be convenient, beautiful and lasting. The perfection of a bridge consists in its having a good foundation, which makes it lasting; an easy ascent to its central arch, which makes it convenient; and just proportion in its several parts, which renders it beautiful. When the architect is not absolutely confined to any particular situation, he ought to choose that part of a river which has its course narrow and shallow, and is the most promising for a good foundation. A straight current, where the shore does not wind, and possessing the farther advantage of a level and stony bed, is the most eligible.

(252.) In erecting bridges of stone, there are 3 or 4 particulars, which principally claim our attention. 1. The abutments not only receive the pressure of the arches, with which they are connected, but they must be capable of resisting the force of the whole combined together. Hence the necessity of a solid foundation at the opposite sides of the river, without which the several arches will be liable at least to partial rents, if the whole does not entirely give way. 2. The direction, which the whole structure is to take across the river, is to be attended to; and this ought always to be at right angles with the current, in order that the stream may more easily pass through each arch, without injuring the piers. 3 We must consider the size of the piers, which ought not to be larger than what is essentially requisite to the support of the arches; for the unnecessary thickness of piers, has the effect of contracting the current of the water, which consequently increases its velocity, and renders the foundation of each pier more liable to be undermined. 4. We must fix on the dimensions, number, and figure of the arches, which are points of great consequence to the whole, in relation to strength, usefulness, beauty, and œconomy.

(253.) Where there is a strong current, and much navigation, with elevated ground on each side wide arches are preferable on many accounts: for they afford a more safe and easy passage to vessels, and, being formed with a smaller number of piers, they become less expensive, prove a less hinderance to the current of water, and in some respects, are more safe than those bridges which are built with narrow arches.—These, perhaps, were the reasons that determined many foreign bridge-builders to choose only one arch, even in cases where there were sufficient room, and great occasion for more; for we read of a bridge in China, whose abutments are two opposite mountains, having but one arch, whose length is 400, and its height (we suppose from the surface of the water) 500 cubits.

(254.) But, on the other hand, where the ground is low on each side, a very wide arch would be improper; for, as a perfect semicircle is not only the most beautiful figure, but most conducive to the strength of an arch, to choose an extensive radius, would occasion the centre of the bridge to be so high, as to render the passage of carriages exceedingly troublesome. To obviate this, by changing the figure of the arch into an ellipsis, is, we presume, an impropriety, as that is neither so strong nor so beautiful as the former: yet it may be admitted, when a river is narrow, and its banks extremely low. In such cases, the danger will often lie in the abutments; for, arches which are either elliptical, or small segments of circles, press their abutments in proportion as their height is to their length. When, therefore, we cannot depend on our abutments, though the river be narrow, the number of arches must be increased, and their figure ought to be a semicircle; as it is then evident, that such arches press more perpendicularly on their piers, and in proportion

proportion to their number, will relieve the abutments.

(255.) The ancients, as well as the moderns, aſſigned to a bridge an even number of piers, in order that an arch, and not a pier, may be upon the centre of the river. This is, indeed, founded not merely on the principles of beauty, but of philoſophy and utility; ſince, in general, it is found, that the ſtrongeſt current runs in the centre of a river, which therefore clears itſelf in the aperture of a bold arch, and makes it leſs dangerous to the piers near the centre.

(256.) The ſize of the pier muſt be determined by that of the arch, and, according to Palladio, ſhould never be leſs than one ſixth part of its width, nor more than one fourth. In the plans of piers for bridges, they are generally drawn of an hexagonal figure, having two long ſides parallel to each other, and at the ends of them, are placed two ſhort ones, facing the courſe of the river, at right angles to each other. Palladio ſays they are ſometimes made ſemicircular, facing the ſtream, in order to divide the water, and that thoſe things which are impetuouſly brought down the river, when they ſtrike againſt them, may be thrown from the piers, and paſs through the middle of the arch.

(257.) As to the proper dimenſions of the key ſtones or archivolts, he gives to their height a 17th part of the width of the arch. This proportion is ſomewhat ſmaller than that propoſed by Mr Gautier, an experienced engineer, who makes the length of the arch ſtones, of an arch 24 feet wide, two feet; and two arches 45, 60, 75, or 90 feet wide, he gives 3, 4, 5, and 6 feet reſpectively, and more than this, when the ſtone is of a ſoft nature. But Mr Belidor ſays, the length of the key ſtones ought always to be one 24th part of the width of the arch, whether the ſtone be hard or ſoft, becauſe, if they are ſoft, their weight is proportionably leſs.

(258.) It appears ſomewhat ſtrange, that ſcientific men ſhould differ ſo widely about the ſize of a key ſtone. The moſt illiterate pretenders to the ſcience could ſcarcely vary more in their opinions reſpecting the ſuitable proportion of a key ſtone, than the difference between one and two feet in an arch of 24 feet wide. To what can ſuch a ridiculous difference be attributed, but to mere modern caprice? or what other tendency can it have, but to excite laughter? However, as a proper medium between the two extremes, we may recommend the judicious proportions adopted by that learned architect, Palladio, in a bridge over a river, 180 feet wide; which he divided into three arches, giving 60 feet to the centre arch, and to the other two, 48 feet each. The piers, which he terms *pilaſters*, were 12 feet thick, or one fifth of the width of the middle arch, and a fourth of the ſmaller ones. The arches were a ſmall portion leſs than a ſemicircle; and their archivolt one 17th of the aperture of the centre arch; and a 24th part of the other two. According to this proportion, the key ſtone of the centre arch was 3 feet 6 inches long, but, according to Mr Gautier, it ſhould have been 4 feet, and agreeably to Mr Belidore, only 2 feet 10 inches. In an arch of 24 feet, Palladio's rule makes the length of the key ſtone a ſmall part more than 18 inches, which is a much more eligible ſize than either the one or the two feet key ſtone of the former gentlemen.

(259.) Upon the thickneſs of the key ſtones, ancient authors ſay nothing; nor have the moderns propoſed any determined rule. This ſilence is probably owing to their being conſidered in common with other ruſtic works, whoſe thickneſs is as 4 to 6.

(260.) The width commonly allowed to ſmall bridges, is 30 feet; but in large ones, near great towns, theſe 30 feet are allowed clear for horſes and carriages, beſides a *banquette* on each ſide for foot paſſengers of 6 or 9 feet each, raiſed about a foot above the common road; the parapet walls on each ſide are about 18 inches thick, and 4 feet high; they generally project the bridge with a cornice underneath: ſometimes balluſtrades of ſtone or iron are placed upon the parapet, as at Weſtminſter and Edinburgh; and this is only practiſed where a bridge is of great length, and built on a magnificent plan.

(261.) The ends of the bridges open from the middle of the two large arches with two wings, making an angle of 45 degrees with the reſt, in order to make their entrance more free: theſe wings are ſupported by a continuation of the arches; that immediately under each wing being ſmaller than the reſt. But the wings of bridges are generally ſupported by the ſolid abutment alone.

SECT. II. *Of* LAYING *the* FOUNDATIONS *of* PIERS, *and* CONDUCTING *the* WORK.

(262.) THE moſt proper ſeaſon for laying the foundations of a bridge is in autumn, when the waters are loweſt, and when the weather is ſuitable for aquatic undertakings. The ancients uſed ſeveral methods to obtain a laſting foundation for their ſtone bridges. Some of theſe we think it proper to deſcribe, that the reader may form his own judgment, by comparing the ancient with the modern practice.

(263.) ALBERTI, who is reckoned among the firſt who wrote on bridges, gives us the following directions for laying the foundation of a pier.—"Firſt raiſe an incloſure to keep off the water, by driving a double row of ſtakes very cloſe and thick ſet, with their heads above the top of the water, like a trench. Then put hurdles within this double row of ſtakes. Cloſe that ſide of the row which is next to the intended pier, and fill up the hollow between the two rows with ruſhes and mud, ramming them together ſo hard, that no water can poſſibly get through. Then, whatever you find within this incloſure, water, mud, ſand, or whatever elſe is a hindrance to you, throw out, and dig till you come at a ſolid foundation; or if you find it neceſſary, make a foundation of wooden piles burnt at the ends, and driven in as cloſe together as poſſible. And here I have obſerved, that the beſt architects uſed to make a continued foundation of the whole length of the bridge, and not merely under each pier; and this they did, not by ſhutting up the whole river at once by one ſingle incloſure, but by firſt excluding one part, then another, and ſo joining the

the whole together by degrees: for it would be impoſſible to withſtand and repel the whole force of the water at once. We muſt therefore, while we are at work on one part, leave another part open for a paſſage for the ſtream. You may leave theſe paſſages either in the channel itſelf, or if you think it more convenient, you may frame wooden dams or hanging channels, by which the ſuperfluous water may run off; but, if you find the expence of a continued foundation for the whole bridge too great, you may only make a ſeparate foundation for every particular pier, in the form of a ſhip, with one angle in the ſtern, and another in the head, lying directly even with the current of the water, that the force of the water may be broken by the angles. We are to remember, that the water is much more dangerous to the ſtern, than to the head of the pier."

(264.) Palladio, who is the next writer, ſays, "To lay the foundations of pilaſters, if the bed of the river be ſtone or gravel ſtone, you have the foundation without any trouble; but in caſe the bottom be quickſand or gravel, you muſt dig therein, till you come to ſolid or firm ground; or if that ſhould be found too laborious or impracticable, you muſt dig moderately deep in the ſand or gravel, and then you muſt thruſt in oaken piles, which will reach the ſolid or firm ground, with the iron by which their points are to be armed. A part only of the bed of the river muſt be incloſed from the water, and then we are to build there; that the other part being left open, the water may have its free current; and ſo go on from part to part."

(265.) Scamozzi propoſes 3 different methods; viz. I. By driving a double row of piles, and filling in between them chalk, or ſome cloſe materials, and afterwards pumping out the water, and then drive other piles within thoſe to form the foundation of the piers. This being done, a platform of oak plank is to be framed and laid upon theſe piles, on which the ſtonework of the pier is to reſt.

(266.) II. His 2d ſcheme is, after having founded the river and levelled its bed, to make a ſtrong oaken frame, or *grillage* as he terms it, which is to be buoyed up with boats, and to lay on it a thick ſtratum of ſtones, well cramped together with iron, and jointed with ſtrong tarras, he directs it to be let down gently to the bed of the river.

(267.) III. After having turned off the courſe of the river to one ſide, by means of fences or channels ſunk on one ſide of the bed of the river, he made a dam with piles entirely acroſs the river, ſufficiently wide to form the piers in; and when he had by digging obtained a proper foundation, he proceeded to build all his piers together, and having raiſed them above low water mark, he again turned the channel of the river into its former place.

(268.) The various circumſtances of different rivers ſeem evidently to have give occaſion to theſe 3 methods in the courſe of Scamozzi's practice; not that he conſidered any of them alike practicable in all caſes. His firſt method, we preſume, was applied in thoſe caſes where a river was deep, and deſtitute of a good natural bed. His ſecond was probably adopted when a river was moderately deep, but of a natural good foundation in its bed capable of ſupporting a heavy pier, founded on a ſtrong frame of oak immediately let down upon it, without the infinite trouble of piling, damming, and pumping of the water. His 3d ſcheme we ſuppoſe to have been applied in fordable ſhallow and narrow rivers, canals, or brooks, &c. where there was a ſuitable place for turning the courſe of the water, either by a wooden fence placed in a diagonal or ſloping direction acroſs the river, or, when the ground on one ſide of the river formed a peninſula, or ſomething approaching to it, in which caſe, by digging through the neck of land, it was eaſy to turn off the ſtream to one ſide, and equally eaſy to bring it back again.

(269.) Such was the ſituation of Trajan's magnificent bridge over the Danube; of which Dion Caſſius gives us the following account: "Trajan built a bridge of over the Danube, which in truth one cannot ſufficiently admire; for though all the works of Trajan are very magnificent yet this far exceeds all the other: the piers were 10 in number, of ſquare ſtone; each of them 150 feet high above the foundation, 60 feet in breadth, and diſtant from one another 170 feet. Though the expence of this work muſt have been exceeding great, yet it becomes more extraordinary by the river's being very rapid, and its bottom of a ſoft nature: where the bridge was built, was the narroweſt part of the river thereabout, for in moſt others it is double or triple this breadth; and although on this account it became ſo much the deeper and the more rigid, yet no other place was ſo ſuitable for this undertaking. The arches were afterwards broken down by Adrian; but the piers are ſtill remaining, which ſeem as it were to teſtify that there is nothing which human ingenuity is not able to effect." The whole length of this bridge was 1590 yards. Some authors add, that it was built in one ſummer, and that Apollodorus of Damaſcus was the architect, who left behind him a deſcription of this great work.

(270.) Moſt of the French bridges have been built on the principles of Scamozzi's firſt method, viz. by driving oak piles and keeping off the water: this they call a *battardeau*, which we ſtile a *coffer-dam*.

(271.) The piers of Westminster bridge were founded by an improved kind of coffer-dam, made capable of floating and riſing again after being ſunk with two or three of the firſt courſes of ſtone for the pier. The bed of the river being of the beſt kind, they had little more to do than to level it; for previous to this operation, they had driven in large piles all round, about 5 feet clear of the dimenſions of the coffer-dam. Theſe piles ſerved both as a defence to the coffer-dams and to ſecure them in their place when ſunk.

(272.) Having laid the firſt courſe of ſtones on the bottom of the coffer-dam, they drew it exactly over the place where it was to be ſunk, and by opening a ſluice made for the purpoſe in the ſide of this veſſel, the water came in and ſunk it.—During about two hours before low water mark, they employed their pumps to draw off the water again, by which means the coffer-dam was once more raiſed to the ſurface, ſo as to afford them

an opportunity of correcting ſuch uneven parts of the foundation as they might have obſerved in their experiment. To the firſt courſe they now added two more, cramping each ſtone together, and filling every joint with tarras mortar; and after having ſo done, they again opened their ſluice and ſunk the machine, and depoſited the ſtone work in the manner juſt related. By this means they ſoon brought the work to within two feet of low water mark, and by the next tide they were enabled to get above it. The ſides of the coffer-dam were ſo contrived, that by relieving a number of iron wedges, they detached themſelves from the bottom, and were at liberty to be uſed for another pier, by being again fixed to a new bottom. It ſhould alſo be obſerved, that when the tide was at its height, the coffer-dam was about 6 feet under the ſurface of the water; but being loaded with 3 courſes of ſtones, and well ſecured by ropes faſtened to the piles, it remained unmoved by the tide.

(273.) Here it will be very natural to enquire why the coffers were not made ſufficiently deep to exclude the water at its greateſt height? The anſwer is eaſy, when the circumſtances are known; for, if it be conſidered, that the water at its full height roſe 16 feet, and that the bed of the river where the pier ſtood was ſunk about 6 feet, a coffer 22 feet high would have been required, a ſize completely unmanageable; and as they alſo had a ſluice in the ſide of the coffer juſt on a level with low water mark, and by which all the ſuperincumbent water was eaſily got rid of, it was evidently unneceſſary to have the coffer higher than 16 feet. The circumſtance of the coffer's being ſo much under water, far from impeding, rather facilitated the execution of the work; for all the water above the edges of the coffer cleared itſelf with greater facility than that within, which paſſed through the ſluice. As for the remaining water below the ſluice, it was carried of by a number of chain pumps, ſo that the workmen were ſhortly enabled to bring the pier above water.—Thus was every pier raiſed above low water mark; and in the courſe of 7 years, the whole bridge was completed.

(274.) Since that period, however, ſome of the arches have exhibited marks of injury and decay; and a method of repairing them, and reducing the enormous weight of the ſtone work, by means of ſpandral walls on the back of the damaged arches, has been projected by a certain architect, who ſuppoſes that there are not leſs than 500 tons of not merely ſuperfluous, but injurious weight upon them.

(275.) The foundation of ESSEX bridge in Dublin was laid in 1753, in a very deep and rapid ſtream by Mr Semple, who adopted the following method. Round the place where the intended pier was to reſt, the workmen drove, at about 30 inches diſtance from each other both ways, two rows of ſtrong piles, which were left at the height of low-water mark. Theſe piles were lined with planks, within which they rammed a quantity of clay, and thus formed the external wall of the coffer-dam. Within this wall, and at about the ſame diſtance, they drove in a row of piles dovetailed at their edges ſo as to receive each other, and which formed the extremities of the plan of the piers at the level of the bed of the river. After having dug to a fine ſtratum of ſand about 4 feet lower, within theſe there were a great number of other piles of oak driven as deep as they poſſibly could be made to penetrate. They next filled up the voids or intervals of theſe piles; and in order to produce a ſolid and petrified foundation, they employed mortar of a peculiar quality, made up of roach lime and ſharp gravel; and with this they began to lay the firſt courſe, ramming in large flat ſtones upon it to about a foot thick. On this firſt courſe they laid a plentiful coat of dry lime and gravel of the ſame quality, on which they again laid ſtones, and then proceeded to lay mortar as at firſt, and continued to do ſo alternately till they came to a perfect level with the piles. Faſtened down to the end of theſe piles were laid three beams, ſtretching the whole length of the pier from ſterling to ſterling, the intervals being filled up with maſonry. On this platform, which was four feet ſix inches under low-water mark, they began to lay the firſt courſe of ſtones for the pier cramped together, and jointed with tarras as uſual, and went forward till they came to a level with the water at ebb tide.

(276.) About the year 1765, the foundation of a ſtone bridge acroſs the river Tees, near STOCKTON, was laid by Mr Shout, and we ſhall here mention thoſe few particulars in which his method differed from the preceding. The workmen began with firſt making very ſtrong coffers of ſolid fir timber about ten feet ſquare, which they piled, jointed, and ſecured one with another till they had gained a ſufficient height to exclude the water at its higheſt tide. The joints of theſe timbers they caulked in the ſame manner as ſhips are; and launching them without any bottoms, they fixed them down to their reſpective ſtations in the river. On the outſide and inſide they drove a number of piles, which they boarded and rammed with clay, to prevent the water from oozing in at the bottom of the coffers. This indeed was their greateſt difficulty, for, owing to quick-ſands and other looſe ſtrata through which the water ſprang in, the labour of digging to the proper kind of foundation was immenſe. The chain pumps played inceſſantly, and by a reſolute perſeverance, the work, which at ſome periods ſeemed to bid defiance to human induſtry and ſkill, was at length brought above low-water mark, and the completion of the whole occupied a ſpace of time nearly equal to Weſtminſter bridge. The bridge is neat and plain, and continues a proof of the ſolidity of its foundation.

(277.) In ſome caſes, when there is a great depth of water, and the bed of the river is tolerably level, or where it can be made ſo by any contrivance, a very ſtrong frame of timber about four times as large as the baſe of the piers may be let down with ſtones upon it round the edges to make it ſink: after fixing it level, piles muſt be driven about it to keep it in its place; and then the foundation may be laid in coffers as before, which are to be kept ſteady by means of ropes tied to the piles.

(278.) This method has frequently been uſed in Ruſſia; and though the bed of the river is not

very

very ſolid, yet ſuch a grate, when once well ſettled with the weight of the pier upon it, will be as firm as if piles had been driven under the foundation; but to prevent the water from gulling under the foundation, and to ſecure it againſt all accidents, a row of dove-tail piles muſt be driven quite round the grating: this precaution being taken, the foundation will be as ſecure as any that can be made.

(279.) The French engineers made uſe of another method in raiſing the foundation of maſonry under water; which is, to drive a row of piles round the intended place, nearer to, or farther from, each other, according as the water is more deep or ſhallow: theſe piles, being ſtrongly bound together in ſeveral places with horizontal tie-beams, ſerve to ſupport a row of dove-tail piles driven within them: when this is done, and all well ſecured according to the ſituation and circumſtances, they dig the foundation by means of a machine with ſcoops, invented for that purpoſe, until they come to a ſolid bed of gravel or clay; or if the bed of the river is of a ſoft conſiſtence to a great depth, it is dug only to about ſix feet, and a grate of timber is laid upon it, which is well ſecured with piles driven into the oppoſite corners of each ſquare, not regarding whether they exceed the upper ſurface of the grate much or not.

(280.) When the foundation is thus prepared, they make a kind of mortar called *beton*, which conſiſts of 12 parts of pozolano or Dutch tarras, 6 of good ſand, 9 of unſlacked line, the beſt that can be had, 13 of ſtone ſplinters not exceeding the bigneſs of an egg, and three parts of tile-duſt, cinders, or ſcales of iron out of a forge: this being well worked together muſt be left ſtanding for about 24 hours, or till it becomes ſo hard as not to be ſeparated without a pick-ax.

(281.) They then threw into the coffer a bed of ruble ſtone, not very large, and ſpread them all over the bottom as nearly level as they can; they next ſink a box full of this hard mortar, broken into pieces, till it come within a little of the bottom; the box is ſo contrived as to be overſet or turned upſide down at any depth; which being done, the pieces of mortar ſoften, and ſo fill up the vacant ſpaces between the ſtones; by theſe means they ſink as much of it as will form a bed of about 12 inches deep all over; they then throw in another bed of ſtone, and continue alternately to throw one of mortar and one of ſtone till the work approaches near the ſurface of the water where it is levelled, and then the reſt is finiſhed with ſtones in the uſual manner.

(282.) Mr Belidor ſays, in the ſecond part of his Hydraulics, vol. ii. p. 188, that Mr Millet de Montville having filled a coffer, containing 27 cubic feet, with maſonry made of this mortar, and ſunk it into the ſea, it was there left ſtanding for two months, and when it was taken out again it was harder than ſtone itſelf.

Sect. III. *Of* Wooden Bridges.

(283.) Wooden bridges may be conſtructed by various methods ſo as to anſwer moſt of the purpoſes of ſtone bridges, and even to laſt a conſiderable time. See Plate XXIII.

(284.) The invention of wooden bridges was certainly prior to thoſe of ſtone: two or three different kinds of them are deſcribed by Palladio, after the manner of the ancients. Some of theſe are one continued frame of wood compoſed of a number of parts, and connected together by lap joints and iron bolts extending quite acroſs the river, without any piles to ſupport them; depending entirely on the truſſed parapets, and on the manner of fixing theſe frames on the ſtone abutments. Palladio built one at Baſſano about 100 feet long by 26 broad, which he divided into five apertures, ſupported and framed as that repreſented in the plate, which was partly taken from his.

(285.) The principal and moſt eſſential points of wooden bridge building are two; firſt, to ſeaſon and prepare the wood ſo as to make it laſting; and ſecondly, to lay a proper and durable pavement on the top.

(286.) The following particulars ſhould be attended to in ſeaſoning the wood. The ſudden decay of fir timber generally is owing to the ſappy nature of its exterior ſurface, which is by no means capable of being remedied by any immediate application of paint previous to its being ſeaſoned: on the contrary, it has been proved, that ſuch an application is actually injurious, ſince it hinders the free admiſſion of air and heat, which would have the property of extracting that ſappy quality which ſo much contributes to decay and rottenneſs. In conſequence of this practice, the ſap ſtrikes inwardly and makes its way to the heart of the wood, the ſubſtance of which is preſently contaminated and deſtroyed.

(287.) As a means of preventing this evil, ſome ſcorch the timber over a flaming fire, turning it about till every ſide acquires a ſort of cruſty ſurface; and in doing this, it neceſſarily follows that the external moiſture is diſſipated. After this proceſs, a mixture of pitch and tar, ſprinkled with ſand and powdered ſhells, may be advantageouſly applied to the parts under water. Thoſe more in ſight after being well ſcorched, and while the wood is hot, ſhould be rubbed over with linſeed oil mixed with a little tar. This will ſtrike deeply into the grain of the wood, and will ſoon harden ſo as to receive as many coats of paint as may appear neceſſary. It has been found that fir timber thus prepared is nearly equal to oak for durability.

(288.) With reſpect to the top of the bridge, and the formation of the pavement, the joiſts that lie on the beams at *a*, ſhould be 9 inches ſcantling, and ſpaced about 18 inches apart, projecting out before the beam, and forming a kind of modillion. Upon theſe joiſts, ſix-inch planks ſhould be laid, and brought forward ſo as to project before the ends of the joiſts, ſerving as a corona to the modillion, which, with the beam on which they reſt, will form ſomething like an entablature to the whole bridge.

(289.) This floor may be firſt covered with pitch and tar, and then with common ſlates; afterwards with one or two courſes of brick ſet in with the beſt of mortar, and, laſtly, with the common paving work.

Sect.

SECT. IV. *Of* HARBOURS.

(290.) The firſt thing to be conſidered is the ſituation; which may be ſome large creek or baſon of water, in or near the place where the harbour is intended to be made, or at the entrance of a large river, or near the ſea: for a harbour ſhould never be dug entirely out of dry land, unleſs upon ſome extraordinary occaſion, where it is impoſſible to do otherwiſe, and yet a harbour is abſolutely neceſſary.

(291.) When a proper place is found, before it is fixed upon, it muſt be conſidered whether ſhips can lie there ſafe in ſtormy weather, eſpecially when thoſe winds blow which are moſt dangerous upon the coaſt; whether there be any hills, riſing ground, or high buildings, that will cover it; in theſe caſes, the ſituation is very proper: but if there be nothing already that will cover the ſhips, it muſt be obſerved whether any covering can be made at a moderate expence, otherwiſe it would be uſeleſs to build a harbour there.

(292.) The next thing to be conſidered is, whether there be a ſufficient depth of water for large ſhips to enter with ſafety, and lie there without touching the ground; and if not, whether the entrance and inſide might not be made deeper at a moderate expence: or, in caſe a ſufficient depth of water is not to be had for large ſhips, whether the harbour would not be uſeful for ſmall merchantmen; for ſuch a one is often of great advantage, when ſituated upon a coaſt much frequented by ſmall coaſting veſſels.

(293.) The form of the harbour muſt be determined in ſuch a manner, that the ſhips which come in when it is ſtormy weather may be ſafe, and ſo as there may be ſufficient room for as many as paſs that way: the depths of water where the piers are to be built muſt be taken at every 10, 15, or 20, feet diſtance, and marked upon piles driven here and there, in order that the workmen may be directed in laying the foundation.

(294.) It ſhould next be conſidered what kind of materials are to be uſed, whether ſtone, brick, or wood. When ſtones are to be had at a moderate price, they ought to be preferred, becauſe the work will be much ſtronger, more laſting, and need fewer repairs, than if made with any other materials: but when ſtones are ſcarce, and the expence becomes greater than what is allowed for building the harbour, the foundation may be made of ſtone as high as low-water mark, and the reſt finiſhed with brick. If this manner of building ſhould ſtill be too expenſive, wood muſt be uſed; that is, piles driven as cloſe as is thought neceſſary; which being faſtened together by croſs-bars, and covered with ſtrong oaken planks, form a kind of coffer, which is filled with all kinds of ſtones, chalk, and ſhingles.

(295.) In laying the foundation, different depths of water, and various ſoils, require particular methods to be followed. When the water is very deep, the French throw in a great quantity of ſtones at random, ſo as to form a much larger baſe than would be required upon dry land; this they continue to do within 3 or 4 feet of the ſurface of the water, where they lay the ſtones in a regular manner, till the foundation is raiſed above the water: they then lay a great weight of ſtones upon it, and let it ſtand during the winter to ſettle; as well as to ſee whether it is firm, and reſiſts the force of the waves and winds: after which they finiſh the ſuperſtructure with large ſtones in the uſual manner.

(296.) As this method requires a great quantity of ſtones, it can be practiſed only in places where ſtones are in plenty; and therefore the following is much preferable. A coffer is made with dovetail piles of about 30 yards long, and as wide as the thickneſs of the foundation is to be; then the ground is dug and levelled, and the wall is built with the beſt mortar. When the mortar is tolerably dry, thoſe piles at the end of the wall are drawn out, the ſide rows are continued to about 30 yards farther, and the end incloſed; then the foundation is cleared, and the ſtones laid as before.

(297.) But it muſt be obſerved, that the end of the foundation finiſhed is left rough, in order that the part next to it may incorporate with it in a proper manner; but if it is not very dry, it will incline that way of itſelf, and bind with the mortar that is thrown in next to it: this method is continued till the whole pier is entirely finiſhed. It muſt likewiſe be obſerved, that the piers are not made of one continued ſolid wall: becauſe in deep water it would be too expenſive: for which reaſon, two walls are built parallel to each other, and the interval between them is filled up with ſhingle, chalk, and ſtone. As theſe walls are in danger of being thruſt out or overſet, by the corps in the middle, together with the great weight laid at times on the pier, they are tied or bound together by croſs-walls at every 30 or 40 yards diſtance, by which they ſupport each other in a firm and ſtrong manner.

(298.) Where there is great plenty of ſtones, piles may be driven in as deep as they will go, at about two or three feet diſtance; and when the foundation is ſunk and levelled, large ſtones may be let down, which will bed themſelves: but care muſt be taken to lay them cloſe, and ſo as to have no two joints over each other; and when the wall is come within reach, the ſtones muſt be crampt together.

(299.) Another method practiſed, is to build in coffers much after the ſame manner as has been done in building the piers of Weſtminſter bridge; (ſee § 271, 272.) but as in this caſe the ends of the coffers are left in the wall, and prevent their joining ſo well as to be water-tight, the water that penetrates through and enters into the corps may occaſion the wall to burſt and to tumble down. Another inconvenience ariſing from this manner of building is, that as there are but few places without worms, which will deſtroy wood wherever they can find it; by their means the water is let into the pier, and conſequently makes the work liable to the ſame accident as has been mentioned above.

(300.) The beſt method to prevent theſe inconveniencies, is to take the wood away, and joggle the ends of the walls together with large ſtones, pouring tarras mortar into the joints; when this is done, the water between the two walls may be pumped out, and the void ſpace filled up with

ſtone and ſhingle as uſual: or if theſe joggles cannot be made water-tight, ſome dove-tail piles muſt be driven at each end as cloſe to the wall as can be done, and a ſtrong ſail-cloth put on the outſide of them, which, when the water is pumpt out, will ſtick ſo cloſe to the piles and wall, that no water can come in. This method is commonly uſed in Ruſſia.

(301.) The thickneſs of a pier ought to be both ſuch as may be able to reſiſt the ſhock of the waves in ſtormy weather; and alſo of a ſufficient breadth above, that ſhips may be laden or unladen whenever it is thought neceſſary. Now, becauſe the ſpecific gravity of the ſea-water is about one half that of brick, and as 2 to 5 in compariſon of ſtone; and ſince the preſſure of ſtagnated water againſt any ſurface is equal to the weight of a priſm of water whoſe altitude is the length of that ſurface, and whoſe baſe is a right-angled iſoſceles triangle, each of the equal ſides being equal to the depth of the water; therefore a pier built with bricks, whoſe thickneſs is equal to the depth of the water, will weigh about four times as much as the preſſure of the water againſt it; and one of ſtone of the ſame breadth, about ſix times and a quarter as much. Now this is not the force to be conſidered, ſince this preſſure is the ſame within as without the pier: but it is that force with which the waves ſtrike againſt the piers, and that depends on the weight and velocity of the waves, which can hardly be determined; becauſe they vary according to the different depths of water, the diſtance from the ſhore, and according to the tides, winds, and other cauſes. Conſequently the proper thickneſs of the piers cannot be determined by any other means than by experience.

(302.) Practitioners ſuppoſe, that if the thickneſs of a pier is equal to the depth of the water, it is ſufficient; but for a greater ſecurity they allow 2, 3, or 4 feet more. This might probably do, if piers were built with ſolid ſtones crampt together; but as this is hardly ever the caſe, and on the contrary, as the inſide is filled up with ſhingle, chalk, or other looſe materials, their rule is not to be depended upon: beſides it makes the ſpace above too narrow for lading and unlading the ſhips, unleſs in a great depth of water; ſo that it does not appear that their method can be followed, excepting in a very few caſes where the water has but very little motion.

(303.) No other materials ſhoud be uſed, when ſtones can be obtained, becauſe they, being of a larger bulk than brick, will better reſiſt the waves by their own weight, till the mortar is grown hard; for after this is effected, brick will reſiſt better againſt the action of ſea-water than ſoft ſtones.

(304.) The wall muſt be built with tarras mortar from the bottom to the height of the low water mark, and the reſt finiſhed with cinder or tile-duſt mortar, which has been found ſufficiently good in thoſe places where the wall is wet and dry alternately. The upper part of the pier ſhould be paved with flat hewn ſtones laid in ſtrong mortar, in order to prevent any water from penetrating into it: iron rings ought alſo to be fixed at proper diſtances, to faſten the ſhips, and prevent them from ſtriking againſt the peir when agitated by the waves.

(305.) Wooden fenders or piles ſhould be driven at the inſide cloſe to the wall, and cramped to it with iron, to prevent the ſhips from touching them, and from being worn by the continual motion. Where the ſea breaks againſt the piers with great violence, breakers ſhould be made at proper diſtances; that is, two rows of piles are driven nearly at right angles to the piers for the length of about 12 or 15 feet, and at about 8 or 10 feet diſtant from each other; and then another to join the two former: theſe piles being covered with planks, and the inſide being filled with ſhingle and ruble ſtones, then the top is paved with ſtones of about a foot in length, ſet long-wiſe to prevent the waves from tearing them up. This precaution is abſolutely neceſſary where the water ruſhes in very ſtrongly.

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ARCHITECTURE, COUNTERFEIT, that which conſiſts of projectures, painted black or white, or in different colours, ſo as to imitate marble. It is alſo called ſcene work, in the painting of columns, &c. for decorating theatres.

ARCHITECTURE, in perſpective, a kind of building, the parts of which are of various modules, and decreaſe proportionably to their diſtance, ſo that the work may appear longer to the view, than it is in reality.

(1.) * ARCHITRAVE. *n. ſ.* [from ἀρχὴ, chief, and *trabs*, Lat. a beam; becauſe it is ſuppoſed to repreſent the principal beam in timber buildings.] That part of the column, or order of a column, which lies immediately upon the capital, and is the loweſt member of the entablature. This member is different in the different orders; and, in building *architrave* doors and windows, the workman frequently follows his own fancy. The *architrave* is ſometimes called the reaſon piece, or maſter beam, in timber buildings, as porticos, cloyſters, &c. In chimnies it is called the mantle-piece; and over jams of doors, and lintels of windows, [illegible] *Builder's Dict.*—The materials laid over this pillar were of wood; through the lightneſs whereof the *architrave* could not ſuffer, nor the column itſelf, being ſo ſubſtantial. *Wotton's Architecture.*

(2.) ARCHITRAVE. See ARCHITECTURE, INDEX; and PLATE X.

ARCHITRAVE DOORS, are thoſe which have an *architrave* on the jambs, and over the door upon the cap-piece, if ſtraight; or on the arch, if the top be curved.

ARCHITRAVE WINDOWS, of timber, are commonly an ogee raiſed out of the ſolid timber, with a liſt over it; though ſometimes the mouldings are ſtruck, and laid on; and ſometimes cut in brick.

ARCHITRICLINUS, in antiquity, the maſter or director of a feaſt, charged with the order and œconomy of it, the covering and uncovering of the tables, the command of the ſervants, and the like. The architriclinus was ſometimes called *ſervus triclinii arcba*, and by the Greeks ἀρχιτρικλῖνος, *i. e. præguſtator*, or *fore-taſter*. Potter takes the architriclinus to ſignify alſo the ſame with the ſympoſiarcha.

ARCHI,

ARCHITYPE. See ARCHETYPE.

ARCHIVAULT, in architecture, the inner contour of a natch, or a band adorned with mouldings, running over the faces of the arch ſtones, and bearing upon the impoſts. It has only a ſingle face in the Tuſcan order, two faces crowned in the Doric and Ionic, and the ſame mouldings as the architrave in the Corinthian and Compoſite. See Plate XIX.

(1.) * ARCHIVES. *n. ſ. without a ſingular*, [*archiva*, Lat.] The places where records or ancient writings are kept. It is perhaps ſometimes uſed for the writings themſelves.—Though we think our words vaniſh with the breath that utters them, yet they become records in God's court, and are laid up in his *archives*, as witneſſes either for or againſt us. *Government of the Tongue.*

(2.) ARCHIVES, SITUATION OF. The archives of ancient Rome were in the temple of Saturn; the archives of the court of chancery are in the rolls office.

ARCHIVIST, } a keeper of archives. Under
ARCHIVISTA, } the emperors, the archiviſt was an officer of great dignity, held equal to the proconſuls, veſted with the quality of a count, ſtyled *clariſſimus*, and exempted from all public offices and taxes. Among the ancient Greeks and Perſians, the truſt was committed to none but men of the firſt rank; among the Franks, the clergy being the only men of letters, kept the office among themſelves.—Since the erection of the electoral college, the Archbiſhop of Mentz has had the direction of the archives of the empire.

ARCHIVOLT. See ARCHIVAULT.

ARCHI-ZUPANUS, [from ἀρχὸς, and ζυπανος, *governor*,] a title given to the prince or deſpot of Servia. In an epiſtle of pope Innocent III. he is called *Magnus Jupanus*.

ARCH-MARSHAL, ARCHIMARISCALLUS, the grand marſhal of the empire: a dignity belonging to the elector of Saxony, who, in that quality, goes immediately before the emperor, on public ſolemnities, bearing a naked ſword.

ARCH-MINISTER, [from ἀρχὸς, and miniſter,] the prime miniſter of a prince, or ſtate. Charles the Bald having declared Boſon his viceroy in Italy under the title of duke, made him alſo his firſt miniſter under that of an arch-miniſter.

ARCH-MONASTERY, [*archimonaſterium*,] an appellation ſometimes given to the greater monaſteries and abbies.

ARCH-NOTARY, [*archinotarius*,] the primicerius, or chief of the notaries. This office is ſuppoſed by ſome to have differed from the arch-chancellor, though wherein the difference conſiſted does not appear.

(1.) ARCHONS, in Grecian antiquity, were magiſtrates of Athens, appointed after the death of Codrus, and the abolition of royalty. See ATTICA. They were choſen from the moſt illuſtrious families till the time of Ariſtides, who got a law paſſed, by which it was enacted, that in electing theſe magiſtrates, leſs regard ſhould be paid to *birth* than to *merit*. The tribunal of the archons was compoſed of nine officers. The firſt was properly archon; by whoſe name the year of his adminiſtration was diſtinguiſhed. The title of the ſecond was king; that of the third, polemarchus: to theſe were added ſix theſmothetæ. Theſe magiſtrates, elected by the ſcrutiny of beans, were obliged to prove, before their reſpective tribes, 1. That they had ſprung, both by father and mother for three deſcents, from citizens of Athens; 2. That they were attached to the worſhip of Apollo, the tutelar god of their country; 3. That they had in their houſe an altar conſecrated to Apollo; 4. That they had been reſpectfully obedient to their parents; an important and ſacred part of their character, from which it was expected, they would be faithful ſervants to their country; 5. That they had ſerved in a military capacity the number of years which the republic required of every citizen: and this qualification gave the ſtate experienced officers; for they were not allowed to quit the army till they were 40 years old. Their fortune too, of which they were to inform thoſe who examined them, was a warrant for their fidelity. After the commiſſioners had made a favourable report of them, they were to ſwear that they would maintain the laws; which obligation, if they neglected, they engaged to ſend to Delphi a ſtatue of the weight of their bodies. According to a law of Solon, if an archon got drunk, he was condemned to pay a heavy fine, and ſometimes even puniſhed with death. Such magiſtrates as the Athenian archons were well intitled to reſpect. Hence it was eternal infamy to inſult them; and Demoſthenes obſerved, that to treat the theſmothetæ with diſreſpect, was to ſhow diſreſpect to the republic. Another qualification indiſpenſably required of the ſecond officer of this tribunal, who was called the king, was, that he had married the daughter of an Athenian citizen, and that he had eſpouſed her a virgin. This was exacted of him, ſays Demoſthenes, becauſe part of his duty was to ſacrifice to the gods jointly with his wife, who, inſtead of appeaſing, would have irritated them, if ſhe had not poſſeſſed both thoſe honours. The enquiry into the private title of the nine archons was very ſevere; and this attention was the more neceſſary, as they had a right to take a ſeat in the Areopagus, after they had quitted their office, and given an account of their adminiſtration. When any obſcurity occurred in the laws relative to religion and the worſhip of the gods, the interpretation was ſubmitted to the tribunal of the archons. Ariſtotle obſerved, that Solon, (whoſe aim was to make his countrymen happy, and who found their government in his time ariſtocratical; by the election of the nine archons, who were annual magiſtrates,) tempered their power by eſtabliſhing the privilege of appealing from them to the people, called by lot to give their ſuffrage, after having taken the oath of the Heliaſtæ, in a place near the Panathenæum, where Hiſſus had formerly calmed a ſedition of the people, and bound them to peace by an oath. The archons were the principal officers, not only in civil, but in ſacred matters, and eſpecially in the myſteries of Bacchus. The archons, however, who were ſurnamed *eponymi*, were chiefly employed in civil affairs; yet they preſided at the great feaſts, and held the firſt rank there. Hence they are ſometimes ſtyled *prieſts*.

(2.) ARCHONS, in modern hiſtory, divers officers, both civil and religious, under the Greek emperors.

emperors. Thus biſhops were ſometimes called *archontes*; as well as the lords of the emperor's court. We alſo read of the archon of the antimenſia, archon of archons, grand archon, archon of churches, archon of the goſpel, archon of the walls, &c.

ARCHONTICI, } in church hiſtory, a branch
ARCHONTICS, } of Valentinians, who maintained that the world was not created by God, but by angels called *Archontes*, or arch-angels. They alſo denied the reſurrection, and ſaid that the devil begat Cain and Abel upon Eve, &c.

ARCHONTIUM, [ἀρχοντιον.] denotes a dignity of the Greek church. See ARCHONS, N° 2.

* ARCH-PHILOSOPHER. *n. ſ.* [from *arch* and *philoſopher*.] Chief philoſopher.—It is no improbable opinion, therefore, which the *arch-philoſopher* was of, that the chiefeſt perſon in every houſehold was always as it were a king. *Hooker, b.* i.

ARCH-PIRATE, the head of a ſet of pirates. *Bailey.*

* ARCH-PRELATE. *n. ſ.* [from *arch* and *prelate*.] Chief prelate.—May we not wonder, that a man of St Baſil's authority and quality, an *archprelate* in the houſe of God, ſhould have his name far and wide called in queſtion. *Hooker, b.* v. § 12.

* ARCH-PRESBYTER. *n. ſ.* [from *arch* and πρεσβυτερ.] Chief preſbyter.—As ſimple deacons are in ſubjection to preſbyters, according to the canon law; ſo are alſo preſbyters and *arch-preſbyters* in ſubjection to theſe arch-deacons. *Ayliffe.*

(1.) * ARCH-PRIEST. *n. ſ.* [from *arch* and *prieſt*.] Chief prieſt.—The word decanus was extended to an eccleſiaſtical dignity, which included the *arch-prieſts*. *Ayliffe's Parergon.*

(2.) ARCH-PRIEST, or ARCH-PRESBYTER, was anciently the firſt perſon after the biſhop; he was ſeated in the church next after the biſhop; and even acted as his vicar in his abſence, as to all ſpiritual concerns. In the 6th century, there were found ſeveral arch-prieſts in the ſame dioceſe; from which time, ſome will have them to be called *deans*. In the ninth century they diſtinguiſhed two kinds of cures or pariſhes; the ſmaller governed by ſimple prieſts; and the baptiſmal churches by arch-prieſts; who, beſide the immediate concern of the cure, had the inſpection of the other inferior prieſts, and gave an account of them to the biſhop, who governed the chief, or cathedral church, in perſon. There are arch-preſbyters ſtill ſubſiſting in the Greek church, veſted with moſt of the functions and privileges of chorepiſcopi, or rural deans.

ARCH-PRIOR was a name ſometimes given to the maſter of the order of Templars.

ARCH-STONE. See KEY-STONE, and VOUSSOIR.

ARCH-SUBDEACON, ARCHISUBDIACONUS, the chief among the ſubdeacons, as the arch-deacon is among the deacons. In ſome copies of the Roman Ordinal, he is called *archiſubdiaconus*.

ARCHTELIN, a corn meaſure of Rotterdam, containing 3 pecks, 5 quarts, and about a pint.

ARCH-TREASURER, the great treaſurer of the German empire. This office was created with the 8th electorate, in favour of the elector Palatine, who had loſt his former electorate, which was given to the duke of Bavaria, by the emperor Ferdinand II. who took it away from Frederic V. elector Palatine, after the battle of Prague, where he was defeated in maintaining his election to the crown of Bohemia. The dignity of arch-treaſurer was afterwards conteſted, but was at laſt ſettled upon the elector of Hanover; who claimed it in virtue of his deſcent from Frederic elector Palatine. Accordingly, his majeſty the king of Great Britain bears the title; which is thus contracted upon his coin; S. R. I. A. T. ET E. *i. e. Sacri Romani Imperii Archi-Theſaurus et Elector*; or arch-treaſurer and elector of the holy Roman empire.

* ARCHWISE. *adv.* [from *arch* and *wiſe*.] In the form of an arch.—The court of arches, ſo called *ab arcuata eccleſia*, or from Bow Church, by reaſon of the ſteeple or clochier thereof, raiſed at the top with ſtone pillars, in faſhion of a bow bent *archwiſe*. *Ayliffe's Parergon.*

ARCHYTAS of Tarentum, a philoſopher of the Pythagorean ſect, and famous for being the maſter of Plato, Eudoxas, and Philolaus, lived about A. A. C. 408. He was an excellent mathematician, particularly in that part of the ſcience which regards mechanics: he is ſaid to have made a wooden pigeon, that could fly, and to be the firſt that brought down mathematics to common uſes. Ariſtotle was indebted to Archytas for his general heads of arrangement, entitled his *Ten Categories*, and probably for that principal idea in his Ethics, *that virtue conſiſts in avoiding exceſſes*; for he taught that every extreme is incompatible with virtue; and he examplified this doctrine in his life. He aſſerted, that God was the beginning, the ſupporter, and the end, of all things. There are two epiſtles preſerved in Diogenes Laertius, one from Archytas to Plato, and another from Plato to Archytas. He acquired great reputation in his legiſlative capacity. He likewiſe commanded the army 7 times, and was never defeated; but was at laſt caſt away in the Adriatic ſea, and thrown upon the coaſt of Apulia.

ARCIGOVINA, a duchy of Dalmatia.

ARCILEUTO, ARCHILUTE, a long and large lute, having its baſs ſtrings lengthened after the manner of the theorbo, and each row doubled, either with a little octave or an uniſon. It is uſed by the Italians for playing a thorough baſs.

ARCION, in botany, a name given by ſome of the ancient writers on medicine, to the plant we call tuſſilago, or colt's foot.

ARCIS-SUR-AUBE, a ſmall town of France, ſeated on the river, and in the department of Aube. Lon. 4. 12. E. Lat. 48. 32. N.

* ARCITENENT. *adj.* [*arcitenens*, Lat.] Bow bearing. *Dict.*

ARCIVÆ AVES, in antiquity, birds which gave bad omens, either by their flight, noiſe, or manner of eating. They were called *arcivæ*, ſometimes alſo *arculæ, quia arcebant ne quid fieret*, prevented or forbad things being done.

ARCK. See ARC, N° 3.

ARCO, a ſtrong town and caſtle in the Trentin, belonging to the houſe of Auſtria. It was taken by the French in 1703, and abandoned ſoon after. It ſtands on the river Sarca, near the northern extremity of the lake Garda, 16 miles SW. of Trent. Lon. 11. 14. E. Lat. 46. 0. N.

(1.) ARCOLF,

(1.) ARCOLE, a village of Pullid in Shropſhire, 3 miles SW. of Hinſtock.

(2.) ARCOLE, or ARKUL, a village 4 miles from Shrewſbury, called alſo HIGH ERCAL.

ARCONA, a ſtrong town ſituated on the iſland of Rugen in the Baltic. It ſtood on a high promontory, with the eaſt, north, and ſouth ſides defended by ſteep and lofty precipices, and the weſt by a wall fifty feet high, proportionably thick, and ſecured by a deep and broad ditch.—It was, however, taken and ruined in 1168, by Valdemar king of Denmark. One of the conditions impoſed by the conqueror was, that the inhabitants ſhould deſtroy a temple they had erected to St Vitus, and deliver up the vaſt treaſure belonging to this tutelary ſaint. Another was, that they ſhould pay 40 ſilver yokes for oxen, by way of tribute, and enter as ſoldiers in the Daniſh ſervice, when called upon.

ARCOP, a village in Herefordſhire.

ARCOS, a ſtrong city of Andaluſia, in Spain, ſeated on a high craggy rock, at the bottom of which runs the Gaudeleto; 28 miles NE. of Cadiz. Its ſtrength lies not only in its ſituation, but in the works erected for its defence, and it is inacceſſible on every ſide but one. The governor reſides in an old caſtle, from whence there is a delightful proſpect, which extends very far into the neighbouring country. Lon. 5. 46. W. Lat. 36. 52. N.

ARCOT, a late city of Indoſtan, 73 miles from Madras, and 217 from Seringapatam. It is the capital of the Carnatic, and is governed by a nabob. Lon. 79. 0. E. Lat. 12. 30. N.

ARCOY, a town of France, in the department of Yonne, in which there is a magazine of ſalt.

ARCTAPELIOTES, in coſmography, the wind which blows at the 45° from N. to E. It is the ſame with what we call the NE. wind.

ARCTATIO, or ARCTITUDO, a ſtraitneſs of the inteſtines, conſtipated from inflammation: alſo a preternatural ſtraitneſs of the *muliebre pudendum* or *uterus*.

* ARCTATION. *n. ſ.* [from *arcto*, to ſtraiten]. Straitening; confinement to a narrow compaſs.

(1.) ARCTIC, in aſtronomy, an epithet given to the north pole, or the pole raiſed above our horizon. It is called the *arctic pole*, on occaſion of the conſtellation of the little bear, in Greek called ἄρκτος; the laſt ſtar in the tail whereof nearly points out the north pole.

(2.) * ARCTICK. *n. ſ.* [from Ἄρκτος, the northern conſtellation.] Northern; lying under the Arctos, or bear. See ARTICK.—

Ever during ſnows, perpetual ſhades
Of darkneſs would conceal their livid blood,
Did not the *arctick* tract ſpontaneous yield
A cheering purple berry big with wine. *Philips.*

(1.) ARCTIC CIRCLE is a leſſer circle of the ſphere, parallel to the equator, and 23° 30′ diſtant from the north pole; from whence its name. This, and its oppoſite, the *antarctic*, are called the two *polar circles*; and may be conceived to be deſcribed by the motion of the poles of the ecliptic, round the poles of the equator, or of the world.

(2.) * ARCTICK CIRCLE. The circle at which the northern frigid zone begins.

ARCTITUDO. See ARCTATIO.

ARCTIUM, BURDOCK: A genus of the polygamia order, belonging to the ſyngeneſia claſs of plants; and in the natural method ranking under the 49th order, Compoſitæ-capitatæ: The calyx is globular; with ſcales having hooks reflected at the tops. There are 3 ſpecies, viz.

1. ARCTIUM LAPPA,
2. ARCTIUM PERSONATA, and
3. ARCTIUM TOMENTOSUM.

They are all troubleſome weeds; ſo require no direction for their culture. The tender ſtems of the lappa, or common burdock, however, deprived of the bark, may be boiled and eat like aſparagus. When raw, they are good with oil and vinegar. Boys catch bats, by throwing the prickly heads of this ſpecies into the air. Cows and goats eat this herb; ſheep and horſe refuſe it; ſwine are not fond of it. The ſeeds, which have a bitteriſh ſubacrid taſte, are eſteemed as very powerful diuretics, given either in the form of emulſion, or in powder, to the quantity of a dram. The roots, which taſte ſweetiſh, with a ſlight auſterity and bitteriſhneſs, are eſteemed aperient, diuretic, and ſudorific; and ſaid to act without irritation, ſo as to be ſafely ventured upon in acute diſorders

ARCTOMYS PALÆSTINORUM, in zoology, the name of an animal of the rat kind, but very large, being of a middle ſize between the rat and the rabbit: it lives in caves, and feeds on vegetables, and is a fierce and bold creature. It uſes its fore feet as hands, and has a cuſtom of ſitting on its buttocks, and in this poſture looks very like a bear.

ARCTOPHYLAX, [from ἄρκτος, bear, and φύλαξ, I guard,] in aſtronomy, a conſtellation, otherwiſe called Bootes.

ARCTOPUS, in botany, a genus of the polygamia dicœcia claſs; and in the natural method ranking under the 45th order, Umbellatæ. The umbella of the male is compound; the involucrum conſiſts of five leaves; the corolla has five petals; the ſtamina are five; and two piſtilli: The umbella of the hermaphrodite is ſimple; the involucrum is divided into 4 parts, is ſpinous, large, and contains many male flowers in the diſk. There is but one ſpecies of arctopus, viz.

ARCTOPUS ECHINATUS, a native of Ethiopia.

ARCTOTHECA ANEMOSPERMOS. See next article.

ARCTOTIS, in botany: A genus of the polygamia neceſſaria order, belonging to the ſyngeneſia claſs of plants; and in the natural method ranking under the 49th order, Compoſitæ-diſcoides. The receptacle is briſtly; the corona of the pappus is pentaphyllous; and the calyx is imbricated with ſcales looſe at the top. It is commonly called *anemoſpermos*, from the reſemblance of its ſeeds to thoſe of the anemone. There are 11 ſpecies, natives of Ethiopia, or the Cape of Good Hope. Of theſe,

1. ARCTOTIS ANGUSTIFOLIA, with ſpear-ſhaped leaves; and,

2. ARCTOTIS ASPERA, with wing-ſhaped woolly leaves, are moſt remarkable for their beauty, having

having rays of a fine yellow or deep gold colour. They flower in May and June. All the ſpecies of actotis may be propagated by cuttings; which ſhould be frequently renewed, as the old plants are ſubject to decay in winter. They may be planted in any of the ſummer months, in a bed of *light* freſh earth; obſerving to ſhade them from the ſun until they have taken root. They ſhould be expoſed to the open air until the latter end of October, or longer, if the weather is favourable, when they muſt be removed into the green houſe.

ARCTURUM INFRA, a ſmall ſtar of the 7th or 8th magnitude, to the ſouth of arcturus, obſerved by Mr Flamſtead, and ſo named by him — Its place is not determined in the Britiſh Catalogue.

ARCTURUS, in aſtronomy, a fixed ſtar, of the firſt magnitude, in the conſtellation of Arctophylax, or Bootes. The word is formed of ἄρκτος, *bear*, and οὐρὰ, *tail*; q. d. *bear's tail*, as being very near it. This ſtar was known to the ancients, and is mentioned by Job as well as by Virgil. Mr Hornſby concludes, that arcturus is the neareſt ſtar to our ſyſtem, viſible in the northern hemiſphere, becauſe the variation of its place, in conſequence of a proper motion of its own, is more remarkable than that of any other of the ſtars; and by comparing a variety of obſervations reſpecting both the quantity and direction of the motion of this ſtar, he infers that the obliquity of the ecliptic decreaſes at the rate of 58″ in 100 years; a quantity which nearly correſponds to the mean of the computation framed by Mr Euler and M. de la Lande, upon the principles of attraction.

ARCTUS, [ἄρκτος.] in aſtronomy, a name given by the Greeks to two conſtellations of the northern hemiſphere; by the Latins called *urſa major* and *minor*, and by us the Greater and Leſſer Bear.

ARCUALIA OSSA, in anatomy, a name uſed by ſome for the *oſſa ſyncipitis*, by others for the *oſſa temporum*.

ARCUALIS SUTURA, among ſurgeons, denotes the coronal ſuture.

ARCUARIUS, an archer.

* ARCUATE. *adj.* [*arcuatus*, Lat.] Bent in the form of an arch.—The cauſe of the confuſion in ſounds, and the inconfuſion of ſpecies viſible, is, for that the ſight worketh in right lines; but ſounds that move in oblique and *arcuate* lines, muſt needs encounter and diſturb the one the other. *Bacon's Nat. Hiſt.*

* ARCUATILE. *adj.* [from *arcuate*.] Bent; inflected. *Dict.*

(1.) * ARCUATION. *n. ſ.* [from *arcuate*.] 1. The act of bending any thing; incurvation. 2. The ſtate of being bent; curvity or crookedneſs. 3. [In gardening.] The method of raiſing by layers ſuch trees as cannot be raiſed from ſeed, or that bear no ſeed, as the elm, lime, alder, willow; and is ſo called from bending down to the ground the branches which ſpring from the offſets or ſtools after they are planted. *Chambers.*

(2.) ARCUATION, METHOD OF PERFORMING. Strong mother plants or ſtools muſt be planted in a clear border, and in a ſtraight line, about ſix feet aſunder. When theſe have ſhot five or ſix main branches from the root, and as many collateral branches, the former muſt be bent to the ground, and there faſtened. The ſmall branches muſt be covered 3 inches deep upon the joints, and have a large baſon of earth made round them to hold the water. About the middle of September they may be opened, and if they have taken root, may be immediately removed into the nurſery; but if they have not ſufficiently extended their roots, they muſt be ſuffered to remain till the ſpring, and then tranſplanted.

(3.) ARCUATION, [from *arcus*, a bow,] is uſed in ſurgery, for an incurvation of the bones; ſuch as we ſee in the caſe of rickets, &c.

* ARCUATURE. *n. ſ.* [*arcuatura*. low Latin.] The bending or curvature of an arch. *Dict.*

ARCUBALISTA, in the military art, a kind of baliſta, probably made after the faſhion of a bow. It is mentioned by Vegetius; but the deſcription of it omitted by him, as too well known then, though now hard to be gueſſed at.

ARCUBALISTARII, or MANUBALISTARII, archers who fought with the *Arcubaliſta*.

* ARCUBALISTER. *n. ſ.* [from *arcus*, a bow, and *baliſta*, an engine.] A croſs-bow man.—King John was eſpied by a very good *arcubaliſter*, who ſaid, that he would ſoon diſpatch the cruel tyrant. God forbid, vile varlet, quoth the earl, that we ſhould procure the death of the holy one of God. *Camden's Remains.*

ARCUCCIO, or ARCUTIO, a machine made of a board covered with pieces of hoops, like the tilt of a waggon; uſed in Italy to prevent children from being overlaid and ſmothered by nurſes or others. Every nurſe in Florence is obliged to lay her child in an arcutio, under pain of excommunication.

ARCUDI, Alexander Thomas d', a Dominican of Venice, who gained conſiderable fame by his writings. They were moſtly biographical, of which the principal is his *Gallutina Letterata*. The hiſtory of Athanaſius was his laſt work. He died about 1720.

ARCUDIUS, Peter, a Greek prieſt, born in the iſle of Corfu. He was ſent by Clement VIII. to Ruſſia, to ſettle ſome religious differences; and he wrote ſeveral zealous pieces in defence of the Catholic religion againſt the Greek and Proteſtant churches. He died about 1621.

ARCULUS, in heathen mythology, the patron of honeſty.

(1.) * ARD. [Saxon.] Signifies natural diſpoſition; as, *Goddard* is a divine temper; *Reinard*, a ſincere temper; *Giſſard*, a bountiful and liberal diſpoſition; *Bernard*, filial affection. *Gibſon.*

(2.) ARD. Mr Bailey obſerves that this Saxon, or Teutonic word, makes a termination of ſeveral common Engliſh words, where it ſignifies quality: ſuch as *drunkard*, *dotard*, &c.

(3.) ARD, the youngeſt ſon of Benjamin.

ARDA, an inſect of ARABIA. See § 11.

ARDAGH, two ſmall towns of Ireland, viz. 1. in the county of Limerick, near Rathkeale: 2. in the county of Longford.

ARDAMA, or ARDAMON, [from ἄρδω, to water] in antiquity, a veſſel of water placed at the door of a perſon deceaſed, till the time of burial, as a token that the family was in mourning,

and to ſerve to ſprinkle and purify perſons as they came out of the houſe.

ARDARAGH, a village of Ireland, in the county of Donegal.

ARDARGIE, a village of Scotland, in the pariſh of Forgandenny, in Perthſhire, ſeated on the Ochil hills, and containing about 18 farm houſes. There is a place near it called the *Roman Camp*, of a ſquare form, about 90 yards every way, defended on one ſide, by a deep hollow, through which runs a rivulet; and on the other 3 by trenches, of 10 yards wide at the top and 14 feet deep.

ARDASSES, in commerce, the coarſeſt of all the ſilks of Perſia; and as it were the refuſe of each kind. In this ſenſe, they ſay, the *legis*, the *houſets*, the *choufi*, and the *payas ardaſſis*, to ſignify the worſt of thoſe four ſorts of Perſian ſilks.

ARDASSINES, in commerce, called in France *ablaques*; a very fine ſort of Perſian ſilk, little inferior in fineneſs to the *ſourbaſſis* or rather *cherbaſſis*, and yet it is little uſed in the ſilk manufactures of Lyons and Tours, becauſe that kind of ſilk will not bear hot water in the winding.

ARDBRACCAN, a ſmall town of Ireland in the county of Meath, 3 miles W. of Navan, and 25 NW. of Dublin. Lon. 7. 0. W. Lat. 53. 40. N.

ARDBURY, or ERDBURY, a village in Warwickſhire near Coventry.

ARDCHATTAN, a pariſh of Scotland, in the county of Argyle, united to that of Muckairn; and formerly the reſidence of St Bede, the walls of whoſe church ſtill remain entire. Theſe united pariſhes extend 24 Scots miles, (or 36 Engliſh,) in length, and about 20 in breadth; and contained, in 1792, about 2350 inhabitants, according to Mr Lud. Grant's report to Sir John Sinclair. The climate is healthy, as an evidence of which Mr Grant mentions one man who died, aged 105, one living turned of 100, and other 3 on the verge of that great age. In the monaſtery of Ardchattan, the ruins of which ſtill remain, a parliament was held by king Robert Bruce, after his defeats at Methven and Dalrie; and it is ſaid the debates were carried on in the Celtic language, which is ſtill the common language of the people.

ARDCLAGH, a pariſh of Scotland, in the extremity of the ſhire and lying SE. of the town of Dairne; about 11 miles long, and nearly 8 broad, containing about 1000 acres of arable land, and 4000 of moſs and moor. The climate is good, but the ſoil poor. It produces, however, as much oats, bear, rye, and potatoes, as ſerves the inhabitants; the number of whom, by Mr Mitchell's report to Sir J. Sinclair, in 1792, was 1186.—Their principal manufactures are plaidens, coarſe tartans, broad cloths and duffles. The hills and woods abound with hares, foxes, deers, moorfowl, partridges, otters, &c. There were 300 horſes, 1000 black cattle, and 2000 ſheep in the pariſh.

(1.) ARDEA, in ancient geography, a town of Latium, the royal reſidence of Turnus king of the Rutuli; ſo called, either from the augury of the heron, or from the exceſſive heat of the country. It was a marſhy, ſickly ſituation. Virgil ſays, it was built by Danaë, the mother of Perſeus, it lay about 5 miles diſtant from the ſea, and 20 from Rome; and was a Roman colony. It is now a village in the Campagnia di Roma. Lon. 17. 49. E. Lat. 41. 30. N.

(II.) ARDEA, in ornithology, a genus of the order of Grallæ. The general characters of this order are theſe: the bill is ſtraight, ſharp, long, and ſomewhat compreſſed, with a furrow that runs from the noſtrils towards the point; the noſtrils are linear; and the feet have four toes. Under this genus Linnæus comprehends the grus or crane, the ciconia or ſtork, and the ardea or heron, of other authors. There are 79 ſpecies, of which the following are the moſt remarkable.

1. ARDEA AMERICANA, or hooping crane of Edwards, is a native of America. (See Pl. XIV.) The crown of the head and temples are naked and papillous; the forehead, nape of the neck, and prime wing feathers, are black; but the body is white: The under part of the head, as far as the lower chap, is red; the beak is yellowiſh, and jagged at the point; the feet are red, and the prime tail feathers white. This ſpecies is often ſeen at the mouths of the Savanna, Aratamaha, and other rivers near St Auguſtine: in ſpring going north to breed, like the common crane, and returning, like that bird, to the ſouth in autumn. In ſummer they are found in Hudſon's Bay, where they arrive in May, and retire in September; and are chiefly met with in unfrequented places, in the neighbourhood of lakes, where they breed. The neſt is made on the ground, compoſed of graſs and feathers. They lay two white eggs, like thoſe of the ſwan, and ſit 20 days; the young are at firſt yellow, changing to white by degrees. Theſe birds have a long loud note, which may be heard at a great diſtance: their food is chiefly worms and inſects, which they ſearch for at the bottom of ponds. The natives of Hudſon's Bay call this ſpecies *Wapaw-ucbechauk*.

2. ARDEA ARGIL, or HURGIL, of Ives, is a very large ſpecies; from tip to tip of the wings meaſuring 14 feet 10 inches; and from the tip of the bill to the claws 7 feet and a half: the bill is 16 inches round at the baſe, of different colours, and nearly of a triangular ſhape; the feathers of the back and wings are very ſtrong, and of an iron colour; thoſe of the breaſt long: over the belly a great deal of down of a dirty white: the legs and half the thighs are naked; the naked parts full 3 feet in length. This monſter, as Ives terms it, inhabits Bengal, and is alſo found at Calcutta; at the laſt place called *Hurgil*. It majeſtically ſtalks along before one, and appears at firſt like a naked Indian. The common opinion is, that the ſouls of the Bramins poſſeſs theſe birds. On opening one of theſe, a terapin or land tortoiſe, 10 inches long, was found in its craw, and a large male black cat was found entire in its ſtomach. In Sumatra there is ſaid to be a great variety of the ſtork kind; ſome of a prodigious ſize, and otherwiſe curious; as the *Boorong Gambing*, and *Boringoolar*, &c. The ſame ſpecies ſeems to have been remarked by Mr Smeathman in Africa, where reſident there; an adult of one of which will meaſure ſeven feet when ſtanding erect. He deſcribes the plumage much the ſame as in Mr Ives's bird; adding, that the cape is monſtrouſly [illegible] the head is covered with white down, thickly [illegible] pered

perfed, appearing not unlike a greyheaded man: on the middle of the neck before, a long conic membrane, like a bladder, ſprinkled very thinly with ſhort down, riſing or falling as the animal moves the beak, and always appearing inflated. Theſe birds are met with in companies. When ſeen at a diſtance, near the mouths of rivers, coming towards an obſerver, which they do with the wings extended, they may well be taken for canoes, upon the ſurface of a ſmooth ſea: when on the ſand banks, for men and women picking up ſhell fiſh or other things on the beach. One of theſe, a young bird, about five feet in height, was brought up tame, and preſented to the chief of the Bananas, where Mr Smeathman lived; and being accuſtomed to be fed in the great hall, ſoon became familiar; duly attending that place at dinner time, and placing itſelf behind its maſter's chair, frequently before any of the gueſts entered. The ſervants were obliged to watch it narrowly, and defend the proviſions with ſwitches in their hands; but, notwithſtanding this, it would frequently ſnatch off ſomewhat, and it once purloined a whole boiled fowl, which it ſwallowed in an inſtant. Its courage is not equal to its voracity; for a child of 8 or 10 years old ſoon puts it to flight with a ſwitch, though at firſt it ſeems to ſtand upon its defence, by threatening with its enormous bill widely extended, and crying out with a loud hoarſe voice like a bear or tiger. It is an enemy to ſmall quadrupeds, as well as birds and reptiles, and deſtroys fowls and chickens, though it dare not attack a hen with her young openly; it preys alſo on rats, young kittens, and the like; and has been known to ſwallow a cat whole: a bone of a ſhin of beef being broken aſunder ſerves it but for two morſels. The individual above-mentioned uſed to fly about the iſland, and rooſt very high among the ſilk-cotton trees; from whence, at 2 or 3 miles diſtance, it would ſpy the dinner carrying acroſs the yard; when, darting from its ſtation, it would enter promiſcuouſly with the women who carried in the diſhes. When ſitting, it was obſerved to reſt itſelf on the whole length of the hind part of the leg. It ſometimes ſtood near, for half an hour after dinner, with the head turning alternately, as if liſtening to the converſation; and during this time would every 3 or 4 minutes void the excrements, which were liquid and whitiſh; and took care always to do this on his legs, by wheeling the back parts round over one or the other, and this regularly on different legs; for if he had muted on the left leg laſt, he would be ſure to do the ſame on the right the next time, never making any miſtake.

3. ARDEA CICONIA, or white ſtork of Ray, has naked eye-balls, and black prime wing-feathers. The ſkin below the feathers, as alſo the beak, feet, and claws, are of a blood colour. It is a native of Europe, Aſia, and Africa; but is ſeldom or never to be met with in Italy. The ciconia feeds upon amphibious animals. It is ſuch an enemy to ſerpents, that it is reckoned almoſt a crime to kill a ſtork. From this favourable treatment, they are ſeen in Holland and the Low Countries walking unconcerned in the middle of the ſtreets. Storks are birds of paſſage; they ſpend the ſummer in Europe, go off to Egypt, Ethiopia, &c. all at once before winter, and do not return till about the middle of March.

4. ARDEA GARZETTA, or egret, is creſted behind; the body is white, the beak black, and the feet greeniſh. It is a moſt elegant bird. It weighs about one pound; and the length is 24 inches, to the end of the legs 32. It is a native of the eaſt. But that formerly it was very frequent in Britain, appears by ſome of the old bills of fare: in the famous feaſt of Archbiſhop Neville, we find no leſs than 1000 aſterides, egrets or egrittes, as it is differently ſpelt. Perhaps the eſteem they were in as a delicacy during thoſe days occaſioned their extirpation in our iſlands: abroad they are ſtill common, eſpecially in the ſouthern parts of Europe, where they appear in flocks. The ſcapulars and the creſt were formerly much eſteemed as ornaments for caps and head-pieces; ſo that aigrette and egret came to ſignify any ornament to a cap, though originally the word was derived from *agre, a cauſe de l'agreur de ſa voix.*

5. ARDEA GRUS, or common crane of Engliſh authors, has a naked papillous crown; the prime feathers of the wings are black; the body is aſh coloured; the prime feathers of the tail are ragged. This ſpecies is far ſpread, being met with in great flocks throughout northern Europe and Aſia; in Sweden, throughout Ruſſia, and Siberia as far as the river Anadyr, migrating even to the arctic circle. In Kamtchatka they are only ſeen on the ſouthern promontory: are migratory, returning northward to breed in ſpring, and generally chooſing the ſame places which had been occupied by them the ſeaſon before. In winter they inhabit the warmer regions, ſuch as Egypt, Aleppo, India, &c. they are alſo met with at the Cape of Good Hope changing place with the ſeaſon. In their migrations they frequently fly ſo high as not to be viſible; their paſſing only being known by the noiſe they make, which is louder than any other bird. In France they are ſeen in ſpring and autumn; but for the moſt part are mere paſſengers.—This ſpecies ſeems to have been formerly a native of Britain; as we find in Willoughby, *p.* 52. that there was a penalty of 20*d.* for deſtroying one of their eggs; and Mr Ray informs us, that in his time they were found during the winter in large flocks in Lincolnſhire and Cambridgeſhire: but at preſent the inhabitants of thoſe counties are ſcarcely acquainted with them; ſo that theſe birds ſeem now to have forſaken our iſland. We are told that they make their neſts in the marſhes, and lay two bluiſh eggs. The young birds are thought very good food. They feed on reptiles of all kinds, as well as on green corn, which laſt they make ſuch havock of as to ruin the farmers wherever flocks of them alight.

6. ARDEA HERODIAS, or CHRISTATA MAXIMA of Cateſby, is creſted behind, has a duſky-coloured black, reddiſh thighs, and the breaſt ſpeckled with oblong black ſpots. It is 4 feet and a half when erect; the bill is about 8 inches from the angle of the mouth to the end of it; and the creſt is made up of long, narrow, brown feathers, the longeſt being 5 inches in length, which it can erect and let fall at pleaſure. It is a native of Virginia, and feeds not only upon fiſh and frogs, but on lizards, eefts, &c. See Plate XIV.

7. ARDEA LEUCOGERANOS of Pallas, or the Siberian crane of Pennant, is four and a half feet when ſtanding erect. The bill is of a red colour; the irides are white: the plumage is white as ſnow, except the 10 firſt greater quills, with the coverts of them, which are black: the legs are long and red. This ſpecies inhabits the vaſt marſhes and lakes in Siberia, eſpecially thoſe about the Iſchim, and along the rivers Ob and Irtiſh. It makes its neſt among the reeds, ſeldom acceſſible by man, upon riſing green graſſy tufts, made up of herbs and graſs heaped together; and lays two aſh-coloured eggs, ſpotted with brown. They are ſhy birds, and always upon their guard againſt an enemy: having a centinel to warn them of an approach: on the leaſt alarm they cry aloud, not unlike the ſwan, and fly off directly. The ſportſman finds, of courſe, much difficulty in approaching them within gunſhot; for, as they ſtand near five feet high from the ground, they are enabled to eſpy him at a great diſtance. Sometimes indeed he approaches them under the cover of a ſtalking horſe, or other object; at other times a ſmall dog will divert their attention, as they will without fear attack the dog, while his maſter gets within reach. In breeding time, however, they are more bold, as they will defend their young even againſt men, ſo as to make it dangerous to come near their haunts. The male and female are ſaid to guard the neſt by turns.

8. ARDEA MAJOR, or common heron, has a black cre* depending from the back part of the head, an aſh-coloured body, and a black line and belt on the neck and breaſt. It is a native of Europe. This bird is remarkably light in proportion to its bulk, ſcarce weighing three pounds and an half: the length is 3 feet 2 inches; the breadth 5 feet 4. The body is very ſmall, and always lean; and the ſkin ſcarce thicker than what is called gold-beater's leaf. It muſt be capable of bearing a long abſtinence, as its food, which is fiſh and frogs, cannot be readily got at all times. It commits great devaſtation in our ponds; but being unprovided with webs to ſwim, nature has furniſhed it with very long legs to wade after its prey. It perches and builds on trees, and ſometimes in high cliffs over the ſea, commonly in company with others, like rooks. It makes its neſt of ſticks, lines it with wool, and lays 5 or 6 large eggs of a pale green colour. During incubation, the male paſſes much time with the female. They deſert their neſts during winter, except in February, when they reſort to repair them. It was formerly in this iſland a bird of game, heron-hawking being ſo favourite a diverſion of our anceſtors, that laws were enacted for the preſervation of the ſpecies, and the perſon who deſtroyed their eggs was liable to a penalty of 20s. for each offence. Not to know the hawk from the heron-ſhaw was an old proverb, (ſince abſurdly corrupted to "He does not know a *hawk* from *a hand-ſaw*,") taken originally from this diverſion; but in courſe of time ſerved to expreſs great ignorance in any ſcience. This bird was formerly much eſteemed as food; made a favourite diſh at great tables, and was valued at the ſame rate as a pheaſant. It is ſaid to be very long lived: by Mr Keyſler's account it may exceed 60 years; and by a recent inſtance of one that was taken in Holland by a hawk belonging to the Stadtholder, a longevity is again confirmed, the bird having a ſilver plate faſtened to one leg, with an inſcription, importing it had been before ſtruck by the elector of Cologne's hawks in 1735.—The cinerea of Linnæus is the female of this ſpecies.

9. ARDEA PAVONIA, or the crowned crane, has an erect briſtly creſt, with the temples and two wattles naked. See Plate XIV. The head is black; the creſt is yellowiſh, and tipped with black at the top; the wings are white; and the feathers of the tail black, and of an equal length. It is a native of Africa, particularly of the coaſt of Guinea, as far as Cape Verd; at this laſt place they are ſaid to be exceedingly tame, and will often come into the court yards to feed with the poultry. Theſe birds are often kept in our menageries, and, with ſhelter at night, live long. Their chief food is ſuppoſed to be worms, and ſuch other inſects as the heron tribe uſually feed on; with vegetables of all kinds. It often ſleeps on one leg; runs very faſt; and is ſaid not only to fly well, but to continue on the wing for a long time together. The fleſh is ſaid to be very tough.

10. ARDEA STELLARIS, or the bittern, has a ſmooth head, and is variegated through the body with dark coloured ſpots of different figures and ſizes. It is a native of Europe, and inhabits the fen countries. It is found ſkulking among the reeds and ſedges; and its uſual poſture is with the head and neck erect, and the beak pointed directly upwards. It will ſuffer perſons to come very near it without riſing; and has been known to ſtrike at boys and at ſportſmen, when wounded and unable to make its eſcape. It flies principally about the duſk of the evening, and then riſes in a very ſingular manner, by a ſpiral aſcent, till it is quite out of ſight. It makes a very ſtrange noiſe when it is among the reeds, and a different and very ſingular one as it riſes on the wing in the night. It builds its neſt with the leaves of water plants on ſome dry clump among the reeds, and lays 5 or 6 eggs of a cinerous green colour. This bird and the heron are very apt to ſtrike at the fowler's eyes when only maimed. The food of the bittern is chiefly frogs; not that it rejects fiſh, for ſmall trouts have been met with in their ſtomachs. In the reign of Henry VIII. it was held in much eſteem at our tables, and valued at 1s. Its fleſh has much the flavour of a hare, and nothing of the fiſhineſs of that of the heron.

12. ARDEA VIOLACEA, or creſted bittern of Catesby, has a white creſt; the body is variegated with black and white, and bluiſh below. Theſe birds are ſeen in Carolina in the rainy ſeaſons: but in the Bahama Iſlands, they breed in buſhes growing among the rocks in prodigious numbers, and are of great uſe to the inhabitants there; who, while theſe birds are young and unable to fly, take them for food. They are, in ſome of their rocky iſlands, ſo numerous, that in a few hours two men will load one of their *calapatches*, or little boats, taking them perching from off the rocks and buſhes, they making no attempt to eſcape, though almoſt full grown. They are called by the Bahamians *crab-catchers*, crabs being what they

they moſtly ſubſiſt on; yet they are well taſted, and free from any rank or fiſhy ſavour.

12. ARDEA NIGRO has a ſtraight greeniſh bill and crimſon irides. The crown of the head is aſh-coloured; the reſt of the head, the upper part of the neck behind, and all the under parts, to the breaſt, black; the back, rump, and tail, and all the under part from the breaſt, are of a bluiſh aſh colour: behind each eye ſprings a tuft of long white feathers, which decline downwards, and hang in an elegant manner: the quills and tail are black at the ends; the legs black. This ſpecies is found in many parts of Africa and Aſia, where they frequent marſhes and the neighbourhood of rivers, as their food is fiſh, like moſt of the heron genus. It is frequently kept in menageries, being endowed with great gentleneſs of manners, added to its being an elegant bird. At various times it puts itſelf into ſtrange and uncouth attitudes, eſpecially thoſe which imitate dancing; and Keyſler mentions one in the Great Duke's gallery, at Florence, which had been taught to dance to a certain tune, when played or ſung to it. The name this bird is known by in the eaſt is *kurki*, or *querky*. Sometimes it will breed in confinement: one is recorded to have lived 24 years at Verſailles, where it had been bred.

ARDEATES, the natives of ARDEA. See N° I.

ARDEATH, a village of Ireland, in the county of Meath.

ARDEBIL, or ARDEVIL, a town of Perſia, in the province of Aderbijan. It was taken and burnt by Jenghiz Khan in 1222, when moſt of the inhabitants were deſtroyed by that monſter, but it has been ſince rebuilt; and is ſtill ranked for dignity among the beſt cities of the kingdom, on account of its having been the reſidence and burying place of ſome of the Perſian kings; particularly the ſepulchre of Sheik Seſi is at this place, to which the people reſort in pilgrimage. His memory indeed deſerves to be honoured; for he founded a place, which they call his *kitchen*, with a revenue ſufficient to maintain 1000 poor people, and to feed them three times a-day. Three or four of the large principal ſtreets have ſhops, and are planted on each ſide with elm and linden trees, to keep off the exceſſive heat of the ſun; but the houſes are poorly built, with bricks dried in the ſun: yet moſt of them, that are not in the bazars or market places, have the pleaſure and conveniency of a garden full of trees bearing fruit; and there are large ſpots in the out parts of the town, where the houſes are at a diſtance from each other, and the ſpaces between planted with trees, which render the city of a large extent. The meidan, or great ſquare, is 300 paces long, and 150 broad, having ſhops all round: which, when this place was in a flouriſhing condition, were ſtored with all manner of valuable commodities. Through the city, two branches of a rivulet paſs, which have been ſometimes ſo much ſwelled by the melting of the ſnow on the mountains, that it required canals to carry off the ſtream. In the reign of Schah Abbas, it broke down the dykes, and carried away a great number of houſes. The city is without walls, and is ſeated in the midſt of a large plain incompaſſed with mountains, the higheſt of which lies weſtward, and is always covered with ſnow. Theſe render the air ſometimes extremely hot, and at others intolerably cold, which occaſion epidemical diſtempers, that carry off great numbers of people. The ſoil produces no fruit near the city but apples, pears, and peaches; and yet is good for both corn and paſture. The ſheep are ſo numerous, that 100,000 have paſſed along the city bridge in a day. There are here ſeveral ſorts of mineral waters, which ſerve both for common bathing, and for the cure of various diſeaſes; one of theſe is a ſulphurous ſpring, whoſe exhalations render the circumambient air extremely diſagreeable. There are ſprings which produce as hot water as if it was boiling, and from which waters are conveyed to the public baths in the city. About half a league from the city, on the right hand of the public road, there is a pool of ſtanding water, which is covered all over with ſalt like ice. Ardebil is ſituated about 25 or 30 miles E. of Tauris. Lon. 48. 20. E. Lat. 38. 15. N. according to Walker; but others place it in Lon. 56. 6. E. and Lat. 36. 5. N.

(1.) ARDECHE, a department of France; bounded on the E. by that of Drome; on the S. by Gard; on the W. by Lozere, and on the N. by Upper Loire; and ſo named from

(2.) ARDECHE, a river of France, which falls into the Rhone.

ARDEE, or ATHERDEE, a town of Ireland, in the county of Louth, 34 miles NW. of Dublin It has a mount called *Caſtle-Guard* nearly 90 feet high, which ſeem to have been an artificial work. The main trench is between 30 and 40 feet deep: the circumference at the top is about 140; and round the foundation it is upwards of 600. Some ſuppoſe it to have been a ſepulchral monument or royal burying place; others that it was a place of aſſembly, for the people to debate on public affairs.

(1.) ARDEN, a common name of foreſts among the ancient Celtæ, from the widely extenſive one which ranged for 500 miles in length acroſs the country of Gaul, or covered more than half the country of Warwick in Britain, and the ſites of which ſtill retain the appellation of Arden, to the much ſmaller one of the ancient Mancenion, that covered and ſurrounded the cite of the preſent Manchester. It was written *Arduen*, by Cæſar and Tacitus in ſpeaking of the foreſt in Gaul, as well as by Oſſian, who only changes the *u* into *v*, in mentioning the woods of Caledonia. It cannot (ſays Mr Whitaker) be compounded of *ar* the poſitive article in Celtic, and the ſubſtantive *den*, as Baxter and Cambden aſſert it to be; but is formed of *and* an adjective, and *ven* the ſame as *den*. The meaning of the name therefore is not, as Mr Baxter renders it, ſimply *the hills*, or even, as the ingenious tranſlator of Oſſian interprets it, the *high hill*. *Ard* ſignifies either *high* or *great*, and *ven* or *den* either an *hill* or *wood*. *Arduen*, *Ardven*, or *Arden*, then, means a conſiderable wood. Thus the name became applicable to ſuch ſites as the *plains* of Warwickſhire and the *hills* of Scotland: and it was given, not only to the moſt extenſive foreſts, to that which was the greateſt in Gaul, or ſo conſiderable in Britain; but to many that were important only within their own contracted diſtricts, as the wood of Mancenion above mentioned, and others.

(2.) ARDEN,

(2.) ARDEN, a village in Yorkſhire, near Thirſk.

(3.) ARDEN, Edward, a gentleman of good family in Warwickſhire, was born in 1532. Becoming a zealous Roman catholic, he was apprehended for a ſuppoſed plot againſt Queen Elizabeth, and executed in 1583.

ARDERNBURG, a town of the Netherlands, in Dutch Flanders, 10 miles NE. of Bruges, and formerly the moſt conſiderable in that country. It now belongs to the French. Lon. 3. 30. E. Lat. 51. 16. N.

* ARDENCY. *n. ſ.* [from *ardent.*] Ardour; eagerneſs; warmth of affection.—Accepted our prayers ſhall be, if qualified with humility, and *ardency*, and perſeverance, ſo far as concerns the end immediate to them. *Hammond.*

(1.) ARDENNES, a department of France, bounded by thoſe of Aiſne on the W. Marne on the S. and Meuſe on the E. and ſo named from

(2.) ARDENNES, a foreſt in France, formerly of vaſt extent; but the trees are in many places grubbed up, and where they ſtood are built cities, towns, and abbeys. At preſent it extends from Thionville, near the country of Liege, to Donchery and Sedan, on the confines of Champagne. The roads are ſo narrow in ſome places, that two waggons cannot paſs each other; and therefore the waggoners are obliged to provide themſelves with bells or horns to give one another notice to ſtop in time.

ARDENORA, a village in Cornwall, between Grampound, and Leſtwithiel.

* ARDENT. *adj.* [*ardens*, Lat. burning.] 1. Hot; burning; fiery.—Chymiſts obſerve, that vegetables, as, lavender, rue, marjoram, &c. diſtilled before fermentation, yield oils without any burning ſpirits; but, after fermentation, yield *ardent* ſpirits without oils; which ſhews, that their oil is, by fermentation, converted into ſpirit. *Newton's Opticks.* 2. Fierce; vehement, having the appearance or quality of fire.—

A knight of ſwarthy face,
High on a cole-black ſteed purſued the chace;
With flaſhing flames his *ardent* eyes were filled.
Dryden.

3. Paſſionate; affectionate: uſed generally of deſire.

Another nymph with fatal pow'r may riſe,
To damp the ſinking beams of Cælia's eyes;
With haughty pride may hear her charms confeſt,
And ſcorn the *ardent* vows that I have bleſt.
Prior.

ARDENTES, in authors of the middle age, an appellation given to thoſe afflicted with the Eryſipelas; ſo called, as ſeeming to be ſcorched by the diſeaſe. Hence alſo the abbey of St Genevieve at Paris was called *Domus Ardentium*, by reaſon, as it is ſaid, that great numbers were cured of that diſtemper at the ſhrine of this ſaint in the reign of Lewis VI.

ARDENT FEVER, a violent burning fever. See CAUSUS.

* ARDENTLY. *adv.* [from *ardent.*] Eagerly; affectionately.—With true zeal may our hearts be moſt *ardently* inflamed to our religion. *Spratt.*

ARDENTNESS. *n. ſ.* [from *ardent.*] the quality or ſtate of being ardent.

ARDENT SPIRITS: ſpirits diſtilled from fermented vegetables, ſo called becauſe they will take fire and burn; ſuch as brandy, rum, arrack, ſpirit of wine, &c.

ARDEOLA, in ornithology, the name of a very beautiful bird, of the Braſils, of the heron kind, but no larger than a pigeon.

ARDER, or ARDRA. See ARDRA.

ARDERN, John, an Engliſh ſurgeon of Newark upon Trent, whom many extol as the firſt reviver of ſurgery in England. He flouriſhed in the 14th century; and wrote a treatiſe on the fiſtula in ano. In the Sloannian library, there is likewiſe a MS. of his entitled *De Re Herberia Phyſica et Chirurgica.* His treatiſe on the fiſtula was publiſhed in 1588.

ARDERS, fallowings, or ploughing of grounds.

ARDERSIER, a pariſh of Scotland, in the county of Inverneſs, two miles and a half in length and as much in breadth: containing, in 1791, according to Mr Pryſe Campbell's report to Sir J. Sinclair, 802 inhabitants, which is nearly double the number it was 50 years ago. The climate is rather ſharp, but the ſoil is very fertile. The pariſh is bounded on the N. by the Moray Firth. There are 8 boats and 66 fiſhermen employed in the herring and white fiſheries.

(1.) ARDES, a peninſula of Ireland, in the county of Down, nearly ſurrounded by the Irish channel, and the bays of Strangford and Carlingfergus. It was anciently a county by itſelf, as appears from a patent roll of 1. Henry I. A. D. 1400, in Bermingham's tower Dublin caſtle, granted to Robert Fitz-jordan Savage, the office of ſheriff of Ardes in Ulſter.

(2.) ARDES, a town of France, in the department of Puys-de-Dome, a great mart for inland trade. Lon. 3. 10. E. Lat. 45. 22 N.

ARDESIA, Iriſh ſlate.

ARDEVIL. See ARDEBIL.

ARDFERT, a town of Ireland, and the ancient capital of Kerry. It had an univerſity, which was held in the higheſt eſteem. It is a biſhop's ſee, and borough by ancient preſcription, and has been held in *commendam* with the biſhopric of Limerick ever ſince the Reſtoration. The biſhops were anciently called Biſhops of Kerry. St Brandon, to whom the cathedral is dedicated, had his firſt education in this country, under Biſhop Erc, but he finiſhed his ſtudies in Connaught, St Jarlath biſhop of Tuam being his preceptor. The ruins here are very extenſive. Near the cathedral was an anchorite tower, the loftieſt and fineſt in the kingdom, being 120 feet high: it fell ſuddenly in 1771. In the ruined churches there are ſeveral inſcriptions round the mouldings of the tomb ſtones; and over an arch, behind Lord Glandore's houſe, is an inſcription in relief done in a maſterly manner, but the characters unknown.

ARDPINNAN, a village of Ireland, in the county of Cork.

ARDGLASS, an ancient but decayed ſea port town of Ireland, in the county of Down, of which it was formerly the principal city. It has a long range of buildings in the ſtile of a caſtle, called by the inhabitants, the *New Works*, although they are ſo *old*, that there is no tradition when or for what purpoſe they were built. This range of fortification extends 250 feet in length, and 84 in breadth. The walls are 3 feet thick and have [illegible] towers

towers in front, one at each end, and one in the centre, which makes them appear uniform and elegant. The buildings have been divided into 36 apartments, 18 above and 18 below; with a ſtair-caſe in the centre. Each apartment on the ground floor, has a ſmall Gothic door, and a large ſquare window; which would ſeem to indicate that they had been ſhops or warehouſes, occupied at ſome very early period, by mercantile people from abroad. Within 10 feet of the S. tower, ſtands a ſquare fort, called *Horn-caſtle*, from the great quantity of oxen and deers horns found about it. It meaſures 40 feet by 30, conſiſts of two ſtories, and from the fire places, appears to have been the kitchen and dining hall belonging to the inhabitants. There are alſo relics of ſeveral other caſtles, towers and gates, within the NE. point of Ardglaſs harbour. There is alſo a curious natural cave on the ſhore. The duties of this port were framed ſo lately as the reign of Charles I. It lies 7 miles NE. of Downpatrick.

ARDGROOM, a harbour of Ireland, in the county of Kerry.

ARDINGLEIGH, a village in Suſſex, near Lewes. It has a fair on the 30th of May.

ARDINGTON, a ſmall town in Berkſhire, N. of Wantage, near the vale of White horſe.

ARDINGWORTH, a village in Northamptonſhire, near Bothwell.

ARDKINGLASS, an ancient ſeat in Argyleſhire, belonging to the Campbells of that title. The caſtle of Ardkinglaſs is very ancient. Mr M'Dougal, Miniſter of Lochgoil-head gives the following deſcription of it in the Statiſtical Account of his pariſh. "The caſtle of Ardkinglaſs is compoſed of three ſeparate towers, each of them fronting an area within. The ſpace, between the towers, is defended by a ſtrong wall, about 15 feet high. In the courſe of this wall is the great gate, which is defended by ſmall round turrets in flank, with apertures, through which thoſe who aſſailed the gate might be annoyed with arrows, or with ſmall fire arms. The gate is alſo defended by a ſmall tower, immediately above it, called the *gate-tower*. Around the area, and within the walls are ſmaller buildings, for lodging ſervants, for holding arms, and for ſtore-houſes and cellars. The caſtle is alſo built in a low ſituation, and could not ſtand out againſt a regular inveſtment. The time in which this caſtle was built is not known; but there is certain evidence of its having been repaired in the year 1586. The old reſidence of the family of Ardkinglaſs, of which the ruins can now ſcarcely be traced, was at a ſmall diſtance from the preſent caſtle, but in a more commanding ſituation."

ARDLE, a river in Perthſhire, which is formed by the junction of the rivulets, Arnot and Briarachan, and gives name to the diſtrict, called STRATHARDLE.

ARDLEY, 1. a ſmall town in Eſſex, near Tending: 2. a village in Oxfordſhire, near Biceſter.

ARDMEANAGH, a diſtrict of Roſs-ſhire.

ARDMILLAN SPA, a chalybeate water of Ireland, in Caſtlereagh, in the county of Down.

ARDMORE, a pariſh of Ireland, in the county of Waterford.

ARDMORE-HEAD, a noted promontory of Waterford on the S. coaſt of Ireland. It forms the E ſide of Yough-hall harbour.

ARDNAMURCHAN, a diſtrict of Scotland in Argyleſhire.

ARDNAREE, a village of Ireland, in the county of Mayo.

ARDOR VENTRICULI, a heat of the ſtomach, uſually expreſſed by the term heart-burn, or *cardialgy*.

ARDOUR. *n. ſ* [*ardor*, Lat. heat.] 1. Heat.—Joy, like a ray of the ſun, reflects with a greater *ardour* and quickneſs, when it rebounds upon a man from the breaſt of his friend. *South.* 2. Heat of affection; as, love, deſire, courage.—

The ſoldiers ſhout around with gen'rous rage;
He prais'd their *ardour*, inly pleas'd to ſee
His hoſt. *Dryden.*

3. The perſon ardent or bright. This is only uſed by *Milton*.—

Nor delay'd the winged ſaint,
After his charge receiv'd; but from among
Thouſand celeſtial *ardours*, where he ſtood
Veil'd with his gorgeous wings, up-ſpringing light,
Flew thro' the midſt of heav'n. *Par. Loſt.*

ARDRA, or } a ſmall kingdom of Africa,
(1.) ARDRAH, } in Guinea properly ſo called. It lies at the bottom of the gulph of St Thomas. The inhabitants are very licentious, and have neither temple nor any place for religious worſhip. However, they are very courageous; and their king was abſolute till lately that the king of Dahomay made war upon this and the neighbouring territories, brought them under ſubjection, and burnt the towns, particularly Ardres. The air is very unwholeſome to Europeans; yet the natives live to a great age; but the ſmall-pox makes great deſtruction among them. The country is fertile in Indian corn, palm-wine, plants, and fruits, which laſt all the year; and they make a great deal of ſalt.

(2.) ARDRAH, or ARDRES, the capital of the above kingdom, (N° 1.) Lon 3. 5 E. Lat. 6. 0. N.

ARDRAHIN, a ſmall town of Ireland in the county of Galway, and province of Connaught.

ARDRES, a ſmall but ſtrong town of France, in the department of the Straits of Calais. An interview was held near it between Francis I. and Henry VIII. king of England in 1520. The plain where the monarchs met, was long afterwards named the *Field of Gold Cloth*, on account of the finery and wealth diſplayed on that occaſion. Ardres is ſeated in the midſt of a moraſs. Lon. 2. 0. E. Lat. 50. 50. N.

ARDROSS, the heights of Roſs-ſhire.

(1.) ARDROSSAN, a pariſh of Scotland, in Ayrſhire, 6 miles long from N. to S. and between 3 and 5 broad from E. to W. Though the ſoil is capable of great improvement, the agriculture of the pariſh is ſtill in a low ſtate. The number of its inhabitants, in 1793, was 1518. Mr Duncan, the miniſter, in his Statiſtical Account, gives the following deſcription of the caſtle. "The caſtle of Ardroſſan is of unknown antiquity, and ſeems, from what is ſtill ſtanding, to have been originally a huge building. Its walls were entire when Cromwell

Cromwell viſited this part of the country, and fixed his head quarters at the county town. That uſurper had rendered himſelf very unpopular by occupying the church of Ayr as an armoury; and, to conciliate the minds of the people to his meaſures, he beautified the town, by building the fort and parapet, which are yet ſtanding. For this purpoſe, he threw down the walls of the Caſtle of Ardroſſan, and carried the ſtones in boats over ſea; ſo little were quarries known in thoſe days, in which the county of Ayr almoſt every where abounds! The earl of Eglintoune at that time reſided in the ſmall iſland of Cumbray, and muſt have ſeen with much pain a place of ſuch ſtrength and beauty belonging to him laid in ruins. After the reſtoration, the fort of Ayr, and ground about it, were granted to this noble family in reward of their loyalty, and by way of compenſation for the demolition of the Caſtle of Ardroſſan."

(2.) ARDROSSAN, a ſmall promontory in Ayrſhire, which gives name to the pariſh, (N° 1.) and which terminates in a ridge of romantic rocks, running into the ſea about a mile and a half from Saltcoats. It is ſituated 6 miles from Irvine, and 18 from Ayr.

ARDS, a barony in the county of Down in Ireland. It is a narrow ſlip of land, in ſome places three, and in none above 6 miles broad; but the ſoil is for the moſt part tolerably good. It lies between the lake of Strangford and the ſea, and in the ſouth part it is oppoſite to Lecale. Sir Thomas Smith obtained a patent for his barony from Queen Elizabeth, and ſent his natural ſon with a colony to poſſeſs it; but he was intercepted and ſlain by an Iriſhman. After Sir Thomas's death, Ards was granted by James I. to ſome of the Scots nobility.

ARDSALLACH, a ſmall town of Ireland in the county of Roſcommon.

ARDSALLAS, a village, in the county of Clare.

ARDSTINCHAR, a river of Scotland, in Airſhire, which runs for about 25 miles through the country, and falls into the ſea at the village of Ballantrae. At the mouth of this river there is a conſiderable ſalmon fiſhery, which yields a rent of above L. 80 a year; but the river being rapid and ſhallow, can only admit of ſmall boats. The ſalmon are thought as good as any in Scotland, and ſell upon the ſpot at 3½d. the lb. and it is but very lately they were more than 1d.

ARDTULLY, a village of Ireland, in the pariſh of Kilgarwan, in the county of Kerry.

ARDUBA, an ancient city of the Pannonians. It was taken by Germanicus about the 7th year of the Chriſtian æra; but its reduction was more owing to the diſagreement that reigned among the inhabitants than to the valour of the Romans. The greater part of the citizens were for ſubmitting; but the women, more fond of their ancient laws and liberties than the men, joined ſome Roman deſerters, and falling upon their huſbands, killed a great number of them; but being at laſt overcome by the men, who then ſubmitted to the Romans, the women either threw themſelves headlong from the tops of the walls, or, ſetting fire to their houſes, burnt themſelves and their children to death.

ARDUINA, BASTARD LYCIUM, in botany, a genus of the pentandria monogynia claſs; the corolla of which has a ſingle petal; the ſtigma is bifid; and the fruit is a double-celled berry with a ſingle ſeed. There is only one ſpecies.

* ARDUITY. *n. ſ.* [from *arduous.*] Height; difficulty. *Dict.*

* ARDUOUS *adj.* [*arduus*, Lat.] 1. Lofty; hard to climb.—

High on Parnaſſus' top her ſons ſhe ſhow'd,
And pointed out thoſe *arduous* paths they trod.
Pope.

2. Difficult.—It was a means to bring him up in the ſchool of arts and policy, and ſo to fit him for that great and *arduous* employment that God deſigned him to. *South.*

* ARDUOUSNESS. *n. ſ.* [from *arduous.*] Height; difficulty.

ARDWELL, a diſtrict of Scotland, in the pariſh of Stonykirk, in Wigtonſhire, containing, in 1791, by Mr Blair's report to Sir John Sinclair, 460 inhabitants. See STONYKIRK.

ALDWICK, a village in Lancaſhire.

(1.) ARE, a river in France.

(2.) ARE, a river in the W. Riding of Yorkſh.

(3.) ARE, or AER, a river in Weſtphalia.

(4.) ARE, or AIR. See AIR.

(5.) * ARE. The third perſon plural of the preſent tenſe of the verb *to be*; as young men *are* raſh, old *are* cautious.

(6.) * ARE, or ALAMIRE. The loweſt note but one in Guido's ſcale of muſick.—

Gamut I am, the ground of all accord,
Are to plead Hortenſio's paſſion;
B mi Bianca take him for thy lord,
C faut, that loves with all affection. *Shakeſp.*

(1.) * AREA. *n. ſ.* [Lat.] 1. The ſurface contained between any lines or boundaries.—The *area* of a triangle is found by knowing the height and the baſe. *Watt's Logick.* 2. Any open ſurface, as, the floor of a room; the open part of a church; the vacant part or ſtage of an amphitheatre. An incloſed place, as liſts, or a bowling green, or graſs-plots.—Let us conceive a floor or *area* of goodly length, with the breadth ſomewhat more than half the longitude. *Wotton.*—The Alban lake is of an oval figure, and, by reaſon of the high mountains that encompaſs it, looks like the *area* of ſome vaſt amphitheatre. *Addiſon.*

(2.) AREA, [from *arere*, to be dry,] in architecture, denotes the ſpace or cite of ground on which an edifice ſtands. It is alſo uſed for inner courts, and ſimilar portions of ground.

(3.) AREA, in geometry, the ſuperficial contents of any figure. Thus, if a figure, *e. g.* a field, be in form of a ſquare, and its ſide be 40 feet long, its area is ſaid to be 1600 ſquare feet; or it contains 1600 little ſquares, each a foot every way.

(4.) AREA, in medicine, a diſeaſe which makes the hair fall off. The area is a general kind of depilation; and is diſtinguiſhed into two ſpecies, Alopecia, and Ophiaſis.

(5.) AREA, in OPTICS. See FIELD.

* *To* AREAD, or AREED. *v. a.* [*ardan*, Sax. to counſel.] To adviſe; to direct.—

But mark what I *aread* thee now: avant,
Fly thither whence thou fled'ſt! If from this hour

Within

Within these hallow'd limits thou appear,
Back to th' infernal pit I drag thee chain'd.
Paradise Lost.

AREB, a kind of imaginary money used in the dominions of the great mogul. Four arebs are equal to one crou, or 100 lacs; one lac to 100,000 roupees.

ABEBADILLO, or ABEBATILLO, a river of Spain, in Old Castile, that falls into the Douro.

AREBO, or AREBON, a town on the slave-coast of Guinea, in Africa, seated at the mouth of the river Formoso. The English had once a factory there, as the Dutch have still. It is a large oblong place, indifferently well peopled, and furnished with houses built of reeds and leaves. Lon. 5. 5. E. Lat. 6. 0. N.

ARECA, the FAUSEL-NUT, in botany, a genus of the order of palmæ pennatifoliæ. The male has no calyx, but three petals, and nine stamina; the female has no calyx; the corolla has three petals, and the calyx is imbricated. There are two species, viz.

1. ARECA CATECHU, a native of India. It has no branches, but its leaves are very beautiful; they form a round tuft at the top of the trunk, which is as straight as an arrow. It grows to the height of 25 or 35 feet, and is a great ornament in gardens. The shell which contains the fruit is smooth without, but rough and hairy within; in which it pretty much resembles the shell of the cocoa nut. Its size is equal to that of a pretty large walnut. Its kernel is as big as a nutmeg, to which it bears a resemblance without, and has also the same whitish veins within when cut in two. In the centre of the fruit, when it is soft, is contained a greyish and almost liquid substance, which grows hard in proportion as it ripens. The extract of this nut has been supposed to be the terra japonica of the shops, at least that it is a very similar substance both in colour and taste; But according to later observations, the genuine drug seems to be obtained from the MIMOSA *Catechu*. The fruit when ripe is astringent, but not unpalatable, and the shell is yellowish. Of this fruit there is a prodigious consumption in the East Indies, there being scarce any person, from the richest to the poorest, who does not make use of it; and the trade they drive in it is incredible. The chief use that is made of areca is to chew it with the leaves of betel, mixing with it lime made of sea shells. Cornelius le Brun asserts, that they rub the leaves of betel with a red drug of Siam, or with white chalk. In order to chew it, they cut the areca into four quarters, and take one quarter of it, which they wrap up in a leaf of betel, over which they lay a little of the lime; afterwards they tie it, by twisting it round. This bit prepared for mastication is called *pinang*; which is a Malayan word used all over the East Indies. The pinang provokes spitting very much, whether it be made with dried or fresh areca; the spittle is red, which colour the areca gives it.—This mastication cools the mouth, and fastens the teeth and gums. When they have done chewing the pinang, they spit out the gross substance that remains in the mouth. They are under a mistake who imagine that fresh areca melts entirely in the mouth. Nor is it a less mistake to think that the teeth which are tinged red during the time of chewing, always retain that colour. As soon as they have done chewing the pinang, they wash their mouth with fresh water, and then their teeth are white again. The Europeans who live at Batavia, or Malacca, and in the Sunda and Moluccа islands, use pinang as much as the Indians do; and by washing their teeth they preserve them white. Some pretend that areca strengthens the stomach, when the juice of it is swallowed, as most of the Indians do. Another property ascribed to it is, its curing or carrying off all that might be unwholesome or corrupt in the gums. When eaten by itself, as is sometimes done by the Indians, it impoverishes the blood, and causes the jaundice; but it is not attended with these inconveniences, when mixed in the usual way with betel. The Siamese call it *flov*, in their language. The best areca of the Indies comes from the island of Ceylon. The Dutch East India Company send a great deal of it in their ships into the kingdom of Bengal. There grows in Malabar, a sort of red areca, which is very proper for dyeing in that colour. The same company send some of it from time to time to Surat and Amadabat, for the use of the dyers in the dominions of the Grand Mogul.

2. ARECA OLERACEA, or true cabbage palm, is the most beautiful, and perhaps the tallest, of all trees. The trunk is perfectly straight, and marked with rings at the vestigiæ of the footstalks of the leaves. Near the ground it is about 7 feet in circumference; but tapers as it ascends, and attains the height of 170 or 200 feet. The bark is of an ash colour, till within 25 or 30 feet of the extremity of the tree; when it alters at once to a deep sea green, which continues to the top. About 5 feet from the beginning of the green part upwards, the trunk is surrounded with its numerous branches, in a circular manner; all the lowermost spreading horizontally with great regularity; and the extremities of many of the higher branches bend wavingly downwards, like so many plumes of feathers. These branches, when full grown, are 20 feet long, more or less; and are thickly set on the trunk alternately, rising gradually superior one to another: Their broad curved sockets so surrounded the trunk, that the sight of it whilst among these, is lost, which again appears among the uppermost branches, and is there inveloped in an upright green conic spire, which beautifully terminates its great height. The above mentioned branches are somewhat round underneath, and slightly grooved on the upper side: They are likewise decorated with a very great number of green pennated leaves: Some of these are near three feet long, and an inch and an half broad, growng narrower towards their points, as well as gradually decreasing in length towards the extremities of the branches. As there are many thousand leaves upon one tree: every branch bearing many scores upon it, and every leaf being set at a small and equal distance from one another, the beauty of such a regular lofty group of waving foliage, susceptible of motion, by the most gentle gale of wind, is not to be described. The middle rib, in each leaf, is strong and prominent,

ſupporting it on the under ſide, the upper appearing ſmooth and ſhining. The pithy part of the leaf being ſcraped off, the inſide texture appears to be ſo many longitudinal thread like filaments. Theſe, being ſpun in the ſame manner as they do hemp, or flax, are uſed in making cordage of every kind, as well as fiſhing nets, which are eſteemed ſtronger than thoſe uſually made from any other material of the like nature. Upon removing the large leaves, or branches, which ſurround the top of the trunk, a little way above the beginning of the green bark juſt mentioned, what is called the *cabbage* is diſcovered lying in many thin, ſnow white, brittle flakes, in taſte reſembling an almond, but ſweeter. This ſubſtance, which cannot be procured without deſtroying the tree, is boiled, and eaten with mutton by the inhabitants of the Weſt Indies, in the ſame manner as turnips and cabbage are with us; though it muſt appear the height of extravagancy and luxury to fell ſo ſtately a tree, which would be an ornament to the moſt magnificent palace in Europe, to gratify the taſte of any epicure, eſpecially as there is but a very ſmall part of it eatable. What is called the *cabbage flower*, grows from that part of the tree where the aſh coloured trunk joins the green part already deſcribed. Its firſt appearance is a green huſky ſpatha, growing to above 20 inches long, and about four broad; the inſide being full of ſmall white ſtringy filaments, full of alternate protuberant knobs, the ſmalleſt of theſe reſembling a fringe of coarſe white thread knotted: theſe are very numerous, and take their riſe from larger footſtalks; and theſe footſtalks likewiſe are all united to different parts of the large parent ſtalks of all. As this huſky ſpatha is opened while thus young, the farinaceous yellow ſeed in embryo, reſembling fine ſaw duſt, is very plentifully diſperſed among theſe ſtringy filaments, which anſwer the uſe of apices in other more regular flowers: theſe filaments being cleared of this duſt, are pickled, and eſteemed among the beſt pickles either in the Weſt Indies or in Europe. But if this ſpatha is not cut down and opened whilſt thus young, but ſuffered to continue on the tree, till it grows ripe and burſts, then the incloſed part, which whilſt young and tender, is fit for pickling, will by that time have acquired an additional hardneſs, becomes ſoon after ligneous, grow buſhy, conſiſting of very many ſmall leaves; and in time produce a great number of ſmall oval thin ſhelled nuts, about the bigneſs of unhuſked coffee berries. Theſe, being planted, produce young cabbage trees. The ſockets or grooves, formed by the broad part of the footſtalks of the branches, are uſed by the negroes as cradles for their children. On the inner ſide of the very young footſtalks are tender pellicles, which when dried, it is ſaid, make a writing paper. The trunks ſerve as gutterings; the pith makes a ſort of ſago; and the nuts yield oil by decoction. In the pith alſo, after the trees are felled, there breeds a kind of worms, or grubs, which are eaten and eſteemed a great delicacy by the French of Martinico, St Domingo, and the adjacent iſlands. Theſe worms, ſays Father Labat, are about two inches long, and of the thickneſs of one's finger; the head is black, and attached to the body, without any diſtinction of neck. Their preparation for the table is as follows: They are ſtrung on wooden ſkewers before a fire; and as ſoon as heated, are rubbed over with raſpings of cruſt, ſalt, pepper, and nutmeg: this powder abſorbs all the fat, which during the cookery would otherwiſe eſcape; when properly roaſted, they are ſerved up with orange and citron ſauce. Theſe worms being expoſed for ſome time to the ſun, are ſaid to yield an oil, which is of great efficacy in the piles.—The oil in queſtion, ſays Labat, is never to be heated before its application to the part affected; as repeated experiments have evinced that its ſpirit is totally diſſipated by the fire.

ARECLUD, or ALCLUYD, the ancient name of Dumbarton, when it was in poſſeſſion of the Mæats, of whoſe kingdom it was the capital.

AREDEM, a town on the Malabar coaſt.

To AREED, *v. a.* To judge. *Spenſ.* See *To* AREAD.

*AREFACTION. *n. ſ.* [*arefactio*, Lat. to dry.] The ſtate of growing dry; the act of drying.—From them, and their motions, principally proceed *arefaction*, and moſt of the effects of nature. *Bacon.*

*To AREFY. *v. a.* [*arefacio*, Lat. to dry.] To dry; to exhauſt of moiſture.—Heat drieth bodies that do eaſily exſpire, as parchment, leaves, roots, clay, *&c.* and ſo doth time or age *arefy*, as in the ſame bodies, *&c. Bacon's Natural Hiſtory.*

AREGA, a town in Portugueſe Eſtremadura.

AREGNO, a diſtrict of Corſica.

AREGON, an old officinal ointment.

AREKEA, a port town of the Red Sea, 55 miles from Suaquem. It is large and well fortified, and has an iſland in the entrance of the port, about 200 paces in diameter.

ARELAS, } or ARELATUM, a town of Gallia
ARELATE, } Narbonenſis, ſituated on the Rhone, denoting a town on, or beyond, a marſh, according to the particular ſituation of the ſpeaker; called *Arelate Sextonarum*, becauſe it had a colony of the ſixth legion. Auſonius ſays there was a double Arelas, one on each ſide of the river, and joined by a bridge. That on the left ſide is thought to have been built by Conſtantine Tiberius's father was ſent by Julius Cæſar, at the head of the colony, and hence the appellation *Julia Paterna*, as appears from an inſcription. It was the favourite place of the Romans, and greatly ornamented; and hence called GALLULA ROMA. It is now called ARLES. Lon. 4. 45. E. Lat. 43. 41. N.

ARELATH, a town in Lancaſhire, near the Duddon, oppoſite to Millum Caſtle.

ARELEY, or ARNLEY, 3 Engliſh villages; viz. 1. in Cheſhire, near Norwich; 2. in Staffordſhire, near Seiſdon; 3. in Shropſhire, extending a mile on the Severn.

ARELEY KING'S; } Two villages in Worceſ-
ARELEY NETHER; } terſhire, near Bewdley.

AREM, or AL-AREM, [Arab. a dam of water,] a vaſt mound or dam, which formed a ſtupendous reſervoir above the city Saba, whoſe rupture cauſed an inundation, famous in eaſtern writers.

(1.) ARENBERG, a county of Germany in the circle of Weſtphalia, which was erected into a principality

principality by Maximilian II. in favour of John de Ligne, Lord of Brabazon.

(1.) AREMBERG, or AREMBURG, } the capital of the county, (See No. 1.) ſeated on the Are, about 24 miles S. of Cologne and defended by a caſtle. Lon. 7. 3. E. Lat. 50. 57. N.

AREMORICA, or ARMORICA, [from *are moer*, Celt. i. e. beyond the ſea,] a part of Gaul, placed by Cæſar, and Hirtius, between the Sequana and Ligeris Pliny ſays, that Aquitania was formerly called *Aremorica*; but in this he is ſingular. In the lower age, Armorica was confined to Bretagne in France.

AREN, a ſmall town of Dorſetſhire, on the coaſt; 4 miles E. of Wareham.

(1.) ARENA, in anatomy, [*arena*, Lat. Sand] gravel bred in the human body.

(2) ARENA, in antiquity, a place where the gladiator's fought; ſo called from its being always ſtrewed with ſand, to conceal from the view of the people the blood ſpilt in the combat. Nero is ſaid to have ſtrewed the arena with gold duſt. See AMPHITHEATRE.

(3) ARENA, in architecture, the middle of a temple, comprehending the whole ſpace between the antæ and the extreme wall of the building.

(4.) ARENA, in geography, a town of Calabria in Naples.

* ARENACEOUS. *adj.* [*arena*, Lat. ſand.] ſandy; having the qualities of ſand.—A piece of the ſtone of the ſame mines, of a yelloviſh brown colour, an *arenaceous* friable ſubſtance, and with ſome white ſpar mixed with it. *Woodward.*

ARENACUM, } one of the 4 towns or larger
ARENACUS, } villages in the iſland of the Batavi, mentioned by Tacitus: Now called ARNHEIM, in Guelderland. Lon. 5. 20. E. Lat. 52. N.

(I.) ARENARIA, in botany, SANDWORT: A genus of the decandria trigynia claſs; and in the natural method ranking under the 22d order, *Caryophyllæ*. The calyx has five open leaves; the petals are five, and entire: the capſule is unilocular, and contains many ſeeds. There are 17 ſpecies, only 7 of which are natives of Britain, viz.

1. ARENARIA LARICIFOLIA, Larch-leaved ſandwort.

2. ARENARIA PEPLOIDES, ſea ſandwort.

3. ARENARIA RUBRA, purple-flowered ſandwort.

4. ARENARIA SAXATILIS, mountain ſandwort.

5. ARENARIA SERPYLLI-FOLIA, leaſt ſandwort.

6. ARENARIA TENUI-FOLIA, fine-leaved ſandwort.

7. ARENARIA TRINERVIS, plantain-leaved ſandwort.

(II.) ARENARIA, in ornithology, a bird called by the Engliſh the *ſcandaroling*, and in ſome places, particularly in Cornwall, the *curwillet*. It is a water fowl, of the long-legged, and open footed kind, and is a little larger than the tringa minor, or ſand piper. These birds are common about the ſea ſhore, and generally fly in large flocks.

(III.) ARENARIA, in Vitruvius's writings, ſandpits, or ground out of which ſand is dug.

ARENARII, in antiquity, gladiators who combated with beaſts in the arena, or amphitheatre. The arenarii were ſlaves of the loweſt rank; and though manumitted, were not capable of being Roman citizens. They were the ſame with the BESTIARII.

ARENARIUM, in eccleſiaſtical writers, a cemetry or burying-ground. The arenaria were properly a kind of pits or caverns, wherein the ancient Chriſtians not only buried their dead, but held their religious aſſemblies in times of perſecution.

* ARENATION. *n. ſ.* [from *arena*, Lat. ſand.] Is uſed by ſome phyſicians for a ſort of dry bath, when the patient ſits with his feet upon hot ſand. *Dict.*

ARENDONK, a town near Antwerp.

* ARENOSE. *adj.* [from *arena*, Lat. Sandy.] full of ſand. *Dict.*

ARENS, or ARENSHARDE, a diſtrict of Denmark, in the duchy of Sleſwick, through which runs the famous wall called DANNEUASKE, which Gottric, king of Denmark, built in the 9th century, acroſs the country from Hollingſted to the Sley, (an extent of 46 miles) as a defence againſt the inroads of the Saxons and Sclavi. The natives of Arens were the firſt in the country who profeſſed Chriſtianity; and their church, built in 826, was often demoliſhed by the idolators.

ARENSBERG, a ſmall town of Germany, ſeated on a hill in the circle of Weſtphalia, upon the river Roer. Lon. 8. 20. E. Lat. 58. 15. N.

ARENSBOURG, } an epiſcopal and maritime
ARENSBURG, } town of Livonia in Sweden, ſeated in the iſle of Oſel, in the Baltic Sea. Lon. 22. 40. E Lat. 58. 15. N.

ARENSHARDE. See ARENS.

ARENSWALDE, a town of Germany, in the New Marche of Brandenburg, ſeated on the lake Slauin, on the frontiers of Pomerania. Lon. 15. 32. E. Lat. 53. 13. N.

ARENTIM, a town of Portugal, in Entre-Duero-E-Minho.

* ARENULOUS. *adj.* [from *arenula*, Lat. ſand.] Full of ſmall ſand; gravelly.

AREOLA, the coloured circle around the nipple of the breaſt. See ANATOMY, INDEX.

AREOMETER. See ARÆOMETER.

AREOPAGITES, Athenian judges, members of the court of Areopagus. See AREOPAGUS, § 1, 4—7.

AREOPAGITIC, belonging to the court of Areopagus.

(1.) AREOPAGUS, a ſovereign tribunal at Athens, famous for the juſtice and impartiality of its decrees, to which the gods themſelves are ſaid to have ſubmitted their differences. The court was ſituated in the town, on a rock or hill oppoſite to the citadel. The word ſignifies ſtrictly, the *rock of Mars*.

(2.) AREOPAGUS, EDIFICE, &c. OF THE. The edifice of the Areopagus was extremely ſimple; and its roof, which was at firſt of the moſt common materials, remained in that ſtate till the time of Auguſtus. This we learn from Vitruvius. Oreſtes was the firſt who thought of embelliſhing it. He raiſed in it an altar to Minerva. He likewiſe adorned it with two ſeats of ſolid ſilver; on one of which the accuſer ſat, and the accuſed on the other. The one ſeat was conſecrated to Injury, and the other to Impudence. This religious

ſketch was brought to perfection by Epimenides, who erected altars to theſe allegorical deities, and ſoon after a temple, which Cicero mentions in his ſecond book of laws. This temple correſponded with that which Oreſtes had built to the Furies, who brought him to Athens, and procured him the protection of Minerva. Epimenides dedicated it a ſecond time to the Furies, or ſevere goddeſſes, as they were termed by the Athenians. A man was thought loſt without reſource, and a victim to every human ill, if he enforced a perjury by invoking the ſacred name of thoſe tremendous divinities. Thoſe who employed their thoughts in ſolving the myſteries of Paganiſm, imagined that the Eumenides had their temple ſo near the court Areopagus, that they might enlighten the judges by their inſpiration, and, by their contmual aſſiſtance, prevent them from committing thoſe errors to which human weakneſs is liable. To propitiate thoſe terrible deities, and to procure their favour for the Areopagus, they were worſhipped with great punctuality and devotion; and the ſenate itſelf appointed their prieſts. Demoſthenes had been nominated to preſide over their ſacrifices; and he thought it very extraordinary, that he, to whom the republic had confided ſo important an office, ſhould be publicly impeached. It was natural to aſſociate with Eumenides the other deities who ſhared with them the ſovereign empire over the dead. Epimenides placed in their temples the ſtatues of Pluto, of Mercury, and of Tellus. They were all, according to Pauſanias of an agreeable form. Each of them was placed upon an altar, on which the citizens, or ſtrangers, who had been acquitted by the Areopagus made their grateful offerings. But it was not to gratitude alone that theſe ſeveral deities owed all the incenſe that ſmoked upon their altars. They who had been accuſed before the ſenate, harraſſed with ſuperſtition, and uncertain how theſe deities would be affected towards them, were laviſh of ſacrifices to obtain their clemency, by which they hoped their judges would likewiſe be influenced. The tomb of Œdipus was another of the ornaments of the Areopagus. It was in the outward court of the Areopagus, where a barge was likewiſe placed, which made a part of the pomp at the public games. Whatever homage and implicit obedience the court of Areopagus might derive from all this religious parade, the public good was always dearer to them than any lower advantages they might have drawn from the altars and temples with which they were ſurrounded.

(2) AREOPAGUS, ESTABLISHMENT OF THE COURT OF. Plutarch attributes the eſtabliſhment of the Areopagus to Solon. Other authors think, with good reaſon, that this tribunal was inſtituted before Solon. But the beſt authorities allow him the honour of its reſtoration. The city of Athens, governed till this time by tribunals of a circumſcribed juriſdiction, which were multiplied by the moſt trifling accidents and circumſtances, took no fixed political or civil form, however cloſely united the members of thoſe tribunals were by their general views towards the public good, and by the common love of their country. As each of thoſe tribunals could only act in proportion to the power delegated to it, it was impoſſible, that ſo many different and unequal impreſſions ſhould give to the great machine of the ſtate, that uniform and regular movement which, by an impulſe always the ſame, would keep each part in the ſituation it ſhould maintain with relation to the whole. To effect this univerſal and harmonious power, it was neceſſary to unite the different channels of public authority, which, by being too much diſtributed, loſt its force. This authority Solon collected, and placed it all in the court of Areopagus, which conſequently became the main ſpring of the government.

(4) AREOPAGUS, MEETINGS AND PROCEEDINGS OF THE COURT OF. The ſenate aſſembled in a hall built on the ſummit of a hill, which was aſcended with difficulty by the old men bent with age. However, as for ſome time they only aſſembled on the three laſt days of each month, they bore with patience this inconvenient ſituation. But public affairs multiplied to ſuch a degree, that they were obliged to add to the three former ſittings a fourth, which was held on the 7th day of the month, and which was ſoon ſucceeded by an aſſembly every day. Their meetings were ſo regular, that they were not interrupted by the moſt ſolemn feſtivals, till Cephiſodorus was archon, who, in the third year of the 105th Olympiad, made a decree, which obliged the Areopagites, to celebrate, after the example of other courts, the Apaturian feaſts which laſted five days. This aſſiduous and painful exerciſe of their office made the Areopagites feel all the inconvenience of the ſituation of their tribunal, and determined them to remove it to a part of the city called the Royal Portico. It was a ſquare expoſed to all the inclemency of the weather. When the judges, who aſſembled there in profound ſilence, had taken their places, they were incloſed by a thread, or rather a cord drawn round them. They held their aſſemblies in the night, that their attention to public affairs might not be diverted by external objects,—and (adds Lucian) that they might only be influenced by the arguments, and not by the preſence and action, of the ſpeakers. This circumſtance explains a paſſage in Athenæus, who tells us, that none knew the numbers nor faces of the Areopagites. The cuſtom of adminiſtering juſtice in the open air was not peculiar to them. It was followed by all the other tribunals when they tried for murder; for two reaſons:—1ſt, That the judges, the ſworn protectors of innocence, might not be hurt by being under cover with criminals, whoſe hands were polluted with blood. 2dly, That the accuſer and the accuſed might not be under the ſame roof. When all the members of the ſenate were convened, a herald enjoined ſilence, and ordered the people to retire. As ſoon as they had departed, the aſſembly proceeded to buſineſs; and as they deemed the leaſt preference to be a flagrant injuſtice, the cauſes which they were to determine were drawn by a kind of lottery; and the ſame chance which brought them up, diſtributed them to different numbers of judges, ſmall or great, according to the importance of the ſeveral cauſes. In early times, the parties themſelves ſtated their cauſe in a ſimple manner. The eloquence of advocates was thought a dangerous talent, fit only to varniſh crimes. But

But afterwards the Areopagus, on this point, relaxed from their ſeverity; — at firſt the accuſed, and ſoon after the accuſers, were permitted to engage thoſe to make the attack and the defence, whoſe profeſſion it was to exert the art of ſpeaking, for others, with accuracy and elegance. Sextus Empericus ſeems not to have ſufficiently diſtinguiſhed times, where he ſays, that the court of Areopagus did not ſuffer thoſe who are to be tried at their bar to avail themſelves of the abilities of others. What undoubtedly led him into that miſtake, was an inviolable cuſtom of that tribunal, which prohibited, in pleadings, all that warm and picturesque oratory which ſeduces the judgment and inflames the paſſions. When the ſuffrages were collected, each perſon gave his in ſilence. They voted with a ſmall flint, which they held betwixt the thumb and the two next fingers, and which they put into one of the two urns that ſtood in a corner of the hall One ſtood before the other. The firſt was called the urn of death; the ſecond, the urn of compaſſion. That of death was of braſs, and was termed proper; that of compaſſion was of wood, and was termed improper. The judges commonly brought their flint to the aſſembly and put them into the urn; but, that all the ſuffrages might be collected, the herald took the two urns, and preſented them, one after another, to every ſenator, commanding him, in the name of the republic, no longer to defer his acquittal or condemnation. For this method of giving ſentence, which was called κρυδδην ψηφον, becauſe it kept the vote of each perſon undiſcovered, the Thirty Tyrants to make themſelves maſters of the deciſions of the Areopagus, ſubſtituted another, by means of which they knew exactly the opinion of each of the judges; for they obliged them to bring their flints publicly, and lay them upon two tables placed before them, the ſituation of which was quite oppoſite to that of the urns; for the firſt of thoſe tables was that of life, and the ſecond that of death. The firſt ſubſtances with which they gave their ſuffrages were not ſmall pieces of the bones of a hog, as ſome authors aſſert, but ſea-ſhells, for which pieces of braſs of the ſame form, termed ſpondyla, were afterwards ſubſtituted. The ſubſtances with which they voted were diſtinguiſhed by their form and colour Thoſe which condemned were black, and perforated in the middle; the others were white, and not perforated. The precaution of piercing the black ones, tends to prove, what we have already obſerved, that the court of Areopagus ſat in the night; for what end did it ſerve to pierce the black ſhells, or flints, if the judges could have ſeen them and the white ones, and conſequently have diſtinguiſhed their colours by the aſſiſtance of the light? But as they paſſed ſentence in the dark, it is evident, that a difference beſides that of colour was neceſſary, to know the black ones from the white. The judges were likewiſe permitted to multiply at pleaſure the diſtinctions between ſigns, which eſſentially diſtinguiſhed the fates of men. After the ſuffrages were collected, they were taken out of the two urns, and put into a third vaſe of braſs. They were then counted; and as the number of white or of black flints was higher or inferior, one of the judges drew with his nail a ſhorter or a longer line on a tablet with a waxen ſurface, on which the reſult of each cauſe was marked. The ſhort line expreſſed acquittal; the long condemnation. With regard to the emoluments of the judges, they were as moderate as thoſe of the advocates. The length of the proceſs did not enhance its expence; and when the deciſion of a cauſe was poſtponed till the next day, the committee were only paid an obulus on that day. Hence, Mercury, in Lucian is ſurpriſed that ſuch ſenſible old men as the ſenators of Areopagus were, ſhould ſell at ſo low a price the trouble of aſcending ſo high.

(5.) AREOPAGUS, NUMBER OF MEMBERS OF THE. As to the number of the judges which compoſed the Areopagus, ſome authors, attentive only to a part of Solon's regulations, by which he enacted, that for the future, none but the nine archons ſhould be admitted members of the Areopagus, have imagined that this tribunal was filled anew every year, and that it never conſiſted of more than nine magiſtrates. This opinion, and ſome others, are refuted by the circumſtantial account which Diogenes Laertius gives us of the condemnation of Socrates. This great man had wiſhed to ſubſtitute a rational hypotheſis, for the fabulous and extravagant ſyſtem of religion which prevailed in his time. His project, however laudable, appeared impious in the eye of ſuperſtition. Information was laid againſt him before the Areopagus, and he had as many accuſers as fellow-citizens. After the charges and the anſwers were heard, they proceeded to ſuffrages. The opinions were divided, but not equally, for the number of thoſe who condemned him exceeded by 281 the number of thoſe who declared him innocent. He made an ironical reply to this iniquitous ſentence, by telling his judges, that he took it for granted, they would admit him to a maintenance in the Prytaneum. On this ſarcaſm, 80 of thoſe who had voted in his favour forſook him, went over to the oppoſite party, and condemned him to die. Here then we have 361 judges who condemned him; to whom, if we add, thoſe who perſiſted in acquitting him, the number muſt be very conſiderable.

(6.) AREOPAGUS, POWERS OF THE COURT OF. The judges of this court, who, under Draco, decided only in caſes of murder, by Solon's regulations took cognizance of crimes of every kind; and the ſame tribunal which inflicted capital puniſhment on murder, poiſoning, burning of houſes, theft, &c. ſtruck at the root of thoſe crimes, by arraigning idleneſs, luxury, and debauchery. Equally attentive to ſtimulate the indolence of the young, and the languor of the old, theſe ſage judges rouſed in the one, the laudable ambition to ſerve the ſtate, and reſtored to the others their former activity. Satisfied that extremes produce the ſame effect, they thought the republic had as much to fear from the exceſs of wealth as from the gripe of poverty. Hence they exacted a minute account of the effects of every individual. Hence their great ſeverity to thoſe idle citizens, who, inſtead of being uſeful members in a ſtate, are its bane and its diſhonour. Iſocrates draws a moſt beautiful and ſtriking picture of thoſe venerable and aſtoniſhing men, and the order and harmony which flouriſhed in Athens by their wiſe adminiſtration. The judges of the Areopagus, ſays

ſays that author, were more induſtrious to prevent crimes, by repreſenting them in an odious light, than to eſtabliſh modes of puniſhment. It was their opinion, that the enemies of the ſtate were the inſtruments deſigned by the gods to puniſh the wicked; but that it was their province to correct and reform public and private manners. They were vigilantly attentive to the conduct of all the citizens, but particularly to that of the youth. They well knew that the impetuoſity of juvenile paſſions gave the moſt violent ſhocks to health and growing virtue; that it was the duty of inſpectors of education to ſoften the auſterity of moral diſcipline with innocent pleaſure; and that no recreations were more eligible than bodily exerciſes which enable a young man to give a good education its full play, which improve health, give a pleaſurable and agreeable vivacity and even fortify the mind. The fortunes of the Athenians were too unequal to admit the ſame mode of education; and therefore the youth were trained in a manner ſuitable to the rank and circumſtances of their reſpective families. Thoſe of the inferior claſſes were taught agriculture and commerce; from this principle, that idleneſs is followed by indigence, and that indigence excites to daring and atrocious crimes. Having thus endeavoured, by wiſe precautions, to preclude the entrance of moral evil, they thought they had little to fear. Exerciſes of the body, ſuch as horſemanſhip and hunting, were objects of education to the youth of liberal fortune. In this ſage diſtribution, their great aim was to prevent the poor from committing crimes, and to facilitate to the rich the acquiſition of virtue. Not ſatisfied with having eſtabliſhed good laws, they were extremely careful to ſee that they were obſerved. With this view, they had divided the city into quarters, and the country into cantons. Thus every thing paſſed under their eyes; nothing eſcaped them; they were acquainted with the private conduct of every citizen. Thoſe who had been guilty of any irregularity were cited before the magiſtrates, and were reprehended, or puniſhed in proportion to their miſdemeanour. The ſame Areopagites obliged the rich to relieve the poor. They repreſſed the intemperance of the youth by a ſevere diſcipline. Corruption in magiſtrates was ſuppreſſed by the puniſhments denounced againſt it; and the old men, at the ſight of the employments of the young, felt themſelves animated with a degree of juvenile vigour and activity. Religion came likewiſe under the cognizance of the Areopagites. Plato durſt never, as we are told by Juſtin Martyr, divulge his private opinion concerning the Deity. He had learned from the Egyptians the doctrine of Moſes. It appeared to him the beſt, and he embraced it with ardour. But his dread of the Areopagites, who were attached to the prevailing ſyſtem, would not permit him even to name the author of ſentiments which oppoſed the common tradition. The public edifices, the cleanneſs of the ſtreets, the pay of the ſoldiers, the diſtribution of the public money; in a word, whatever intereſted the republic, was under the direction of the Areopagus. The people themſelves, jealous as they were of their power, did nothing without conſulting this aſſembly, and ſuffered it, without a murmur, to amend their precipitate decrees. Yet this authority, however great it may ſeem, was ſubject to the laws; by them rewards and puniſhments were determined; and thoſe reſpectable judges gave an account of the exerciſe of their truſt to public cenſors, who were placed betwixt them and the people, to prevent the ariſtocracy from growing too powerful.

(7.) AREOPAGUS, QUALIFICATIONS OF THE MEMBERS OF THE. The moſt important qualifications were required in thoſe who entered into the Areopagus. Solon made a law, by which they who had not been archons for a year ſhould not be admitted members of the Areopagus. To give more force to this law, he ſubjected himſelf to it, and was only admitted on that title. This was but the firſt ſtep; thoſe annual magiſtrates, after having given law to the republic, were interrogated on their adminiſtration. If their conduct was found irreproachable, they were admitted Areopagites with eulogium; but the ſmalleſt miſconduct excluded them from that honour for ever. What adminiſtration was not to be expected from a tribunal ſo well compoſed! what veneration was not due to men of ſuch rare talents and virtue? ſuch reſpect was paid them, that people preſumed not to laugh in their preſence; and ſuch was their reputation for equity, that thoſe whom they condemned, or diſmiſſed without granting their petition, never complained that they had been unjuſtly treated.

(8.) AREOPAGUS, SENTENCES, CORRUPTION, AND DECLINE OF THE. Of all the judgments of the Areopagus, the moſt famous one, excepting that of Mars, was the ſentence which they paſſed on Oreſtes His trial, which happened under Demophoon the 12th king of Athens, in 375 of the Attic æra, owed all its fame to a remarkable circumſtance, that gave riſe to a cuſtom which was obſerved ever afterwards. Oreſtes had killed his mother. He was accuſed before the Areopagus, and cited to appear in that court. He would have loſt his life in conſequence of the equal diviſion of the votes, had not Minerva, moved with his misfortunes, declared herſelf for thoſe who had abſolved him, and joined her ſuffrages to theirs. Thus Oreſtes was ſaved. In veneration to this miracle, the Areopagites, whenever the ſuffrages were equally divided, decided in favour of the accuſed, by granting him what they termed *the feet of Minerva*. Cephalus and Dædalus were condemned by the Areopagus long before the time of Oreſtes. We find in ancient authors ſome deciſions of this tribunal, which bear the ſtrongeſt marks of juſtice, though their objects are not intereſting. We ſhall here quote an anecdote from Aulus Gellius, and Valerius Maximus, of a woman who was accuſed of having poiſoned her huſband and her ſon. She was taken and brought before Dolabella, who was then proconſul of Aſia. She was no ſooner in his preſence than ſhe owned the fact; and added, that ſhe had very good reaſons for putting her huſband and her ſon to death. —"I had (ſaid ſhe) to my firſt huſband a ſon whom I tenderly loved, and whoſe virtues rendered him worthy of my affection. My ſecond huſband

hand, and the ſon whom I bare to him, murdered my favourite child. I thought it would have been unjuſt to have ſuffered thoſe two monſters of barbarity to live. If you think, Sir, that I have committed a crime, it is your province to puniſh it: I certainly ſhall never repent of it." This affair embarraſſed Dolabella. She was afterwards ſent to the Areopagus; and that court, when they had examined her a long time, ordered her and her accuſer to appear before them again a hundred years after, from the firſt day of her trial. We muſt not, however, ſuppoſe that the Areopagus always preſerved its old reputation; for ſuch is the conſtitution of human affairs, that perfection is a tranſitory ſtate. Pericles, who lived about 100 years after Solon, to flatter the people and win them to his party, uſed his utmoſt efforts to weaken the authority of the Areopagus, which was then diſliked by the multitude. He took from it the cognizance of many affairs which had before come under its juriſdiction; and, to forward his deſign of humbling it, employed the eloquence of Ephialtes, whoſe talents were formidable, and who was an avowed enemy to the great men of Athens. The Areopagus itſelf ſeemed to ſecond the endeavours of a man who projected its ruin, and by its miſconduct haſtened its fall. The old rules of the court, by which none were admitted its members but thoſe whoſe unexceptionable conduct would ſupport its majeſty, ſeemed too ſevere. They grew leſs delicate in their choice; and preſuming that the faults with which they diſpenſed, would ſoon be reformed in the ſociety of ſo many good examples, vice imperceptibly crept in among them: corruption, at firſt ſecret and timid, grew inſenſibly open and daring, and made ſuch progreſs, that the moſt ſhameful crimes were ſoon exhibited on the ſtage; and they were not copied from the low and abandoned multitude, but from thoſe ſenators, once the venerable and auſtere cenſors of idleneſs and of vice. Demetrius, the comic poet, wrote a piece which he intitled *The Areopagite*, where he ſtrips the maſk off thoſe hypocritical legiſlators, who were now equally apt to be ſeduced by wealth and by beauty. So much had the Athenian ſenate degenerated in the days of Iſocrates, about 340 years before the Chriſtian æra. Before this tribunal St Paul was called to give an account of his doctrine, and converted Dionyſius one of their number. The end of this court of judicature is as obſcure as its origin, which was derived from very remote antiquity. It exiſted, with the other magiſtracies, in the time of Pauſanias, i. e. in the 3d century. The term of its ſubſequent duration is not aſcertained: but a writer, who lived under the emperors Theodoſius the Elder and Younger, in the 5th century, mentions it as extinct.

AREOPOLIS. See Ar.

AREOPOLITÆ, the inhabitants of Ar.

AREOSTYLE. See Aræostyle.

AREOTECTONICS, that part of fortification which teaches to attack an enemy ſafely and fight vantageouſly.

* *AREOTICK*. *adj.* [ἀραιοτικὸς.] Attenuents, plied to medicines that diſſolve viſcidities, ſo it the morbific matter may be carried off by eat, or inſenſible perſpiration. *Dict.*

AREOTICS. See Aræotics.

AREQUIBA, or } a city of S. America, one of
AREQUIPA, } the moſt beautiful cities in all Peru, ſituated in the valley of Quilca, 100 leagues from Lima, and 20 from the ſea, with which it communicates by a fine river. The entrance into the harbour is rather ſhallow for ſhips of great burden; but when once they are entered, they may ride ſecurely in 18 fathoms water. This city was founded in 1539, by order of Don Franciſco Pizarro, in a place known likewiſe by the name of *Arequiba*; but its ſituation being found diſadvantageous, the inhabitants obtained leave to remove to the place where the city now ſtands. The houſes are built of ſtone, and vaulted; and, contrary to what is uſual in warm countries, they are lofty, neatly furniſhed within, and finely decorated on the outſide. The inhabitants alſo are exempt from many diſeaſes common in other parts of Peru; which perhaps is owing to their keeping the ſtreets clean by means of canals which extend to the river. The temperature of the air is extremely good; and though ſometimes a ſlight froſt is perceivable, the cold is never exceſſive, nor the heat troubleſome, ſo that the ſurrounding fields are clothed with perpetual verdure. Theſe natural advantages however, are conſiderably allayed by its being very ſubject to earthquakes, by which it has been often laid in ruins; notwithſtanding which it is populous. Lon. 73. 5. W. Lat. 17. 5. S.

ARERISEMENT, a law term for ſurpriſe, or affright. *Bailey.*

ARES, a term framed by Paracelſus, to expreſs a hidden diſpoſer, in the three principles of things, from which each being receives its proper form and ſubſtance, and aſſumes its own ſpecific nature, not that of any other being. Paracelſus diſtinguiſhes the ares into *arcbeical*, which is natural; and *chemical*, which is artificial. See Archeus.

ARESKOUI, the *Mars*, or god of war, of the American Indians.

To ARET, *v. a.* to accuſe. *Chaue.*

ARETÆUS of Cappadocia, a Greek phyſician, of the ſect of the Pneumatiſts, lived in the reign of Auguſtus, according to ſome; according to others, under Trajan or Adrian. He wrote ſeveral treatiſes in the Ionian dialect, on acute diſeaſes, and other medicinal ſubjects; ſome of which are ſtill extant. The beſt edition of his works is that of Boerhaave, in Greek and Latin, with notes, printed in 1731; that of Wigan, printed at Oxford in 1723, in folio, is alſo much eſteemed.

ARETALOGI. See Aretologi.

ARETAPHILA of Cyrene, the wife of Phœdimus, a nobleman of that place, whom Nicocrates murdered for the ſake of his wife. Yet the tyrant, ſuſpecting that ſhe deſigned to poiſon him, put her to the rack to extort a confeſſion, and afterwards begged her forgiveneſs. She, however, managed matters ſo as to get Nicocrates ſlain; and his brother, aſcended the throne, whom ſhe delivered to Arabus, king of Lybia, by which ſhe freed her country from oppreſſion.

(1.) ARETHUSA, in botany: A genus of the gynandria diandria claſs; and in the natural method ranking under the 7th order, *Orchideæ*. The generic character is taken from the nectarium, which is tubular, ſituated at the bottom of the corolla,

corolla, and the inferior labium fixed to the ſtylus There are four ſpecies; all natives of America, except

ARETHUSA CAPENSIS, which is only found at the Cape of Good Hope.

(2.) ARETHUSA, in fabulous hiſtory, the daughter of Nereus and Doris, and the companion of Diana, who changed her into a fountain to deliver her from the purſuit of her lover Alpheus.

(3.) ARETHUSA, in geography, a celebrated fountain near the city of Syracuſe in Sicily, famous for the quantity of its waters, and the number of fiſhes it contained. Many fables were invented by the ancients concerning this fountain. They had alſo a notion that the river ALPHEUS runs under or through the waters of the ſea, without mixing with them, from Peloponneſus to Sicily. Mr Brydone informs us, that it ſtill continues to ſend forth an immenſe quantity of water, riſing at once to the ſize of a river, but is entirely abandoned by the fiſhes it formerly contained in ſuch plenty. At ſome diſtance from Arethuſa is a fountain of freſh water which boils up very ſtrongly in the ſea, inſomuch that, after piercing the ſalt water, it may be ſometimes taken up very little affected by it. This fountain Mr Brydone thinks the ancients were ignorant of, or they would not have failed to uſe it as an argument for the ſubmarine journey of Alpheus. Mr Swinburn deſcribes this once famous fountain as a large pool of water near the quay, defended from the ſea by a wall, and almoſt hidden by houſes on every other ſide. The water is not ſalt, but brackiſh, and fit for no purpoſe but waſhing linen. "This (ſays he) is the celebrated fountain of Arethuſa, whoſe ſoft poetical name is known to every reader. The fable of the nymph and her conſtant lover Alpheus, the excellence of the ſpring, and the charms of its ſituation, are themes on which ancient and modern poets have indulged their fancy, and exerciſed their pens Alas, how altered! rubbiſh chokes up its wholeſome ſources; the waves have found a paſſage through the rocks, which repeated earthquakes have ſplit; and not a fiſh is to be ſeen in it. Sometimes, after an earthquake, it has been left dry; and at other times, the whole maſs of its waters have been tainted by ſubterraneous effluvia. Its fountain-head probably lies among the neighbouring hills."

ARETIA, in botany: A genus of the pentandria monogynia claſs; and in the natural method ranking under the 21ſt order, *Pretiæ*. The corolla is divided into five parts; the tube of the corolla is ovated; and the capſule is globular, and conſiſts of but one cell. There is only one ſpecies, viz.

ARETIA ALPINA.

(1.) ARETIN, Francis, a man of great reading, and well acquainted with the Greek language. He tranſlated into Latin the Commentaries of St Chryſoſtom upon St John, and about 20 Homilies of the ſame father; alſo the Letters of Phalaris; and wrote a treatiſe *De balneis Puteolanis*. He ſtudied at Sienna about 1443; and afterwards taught law there with ſuch reputation, that they called him the *Prince of Subtleties*, and his wit became proverbial. He diſplayed his talents chiefly in diſputes, in which nobody could withſtand him. He gave his opinions in law with ſo much confidence, as to aſſure thoſe who conſulted him that they ſhould carry their cauſe: nor did experience contradict him; for it was a common ſaying at the bar, ſuch a cauſe has been condemned by Aretin, it muſt therefore be loſt. He taught alſo in the univerſities of Piſa, and Ferrara. He was at Rome under the pontificate of Sixtus IV. but ſoon perceived that the great hopes which he had built upon his reputation would come to nothing. This pope, however, declared he would have given him a cardinal's hat, had he not thought he ſhould have done a public injury by depriving the youth of ſuch an excellent profeſſor. When old age would not permit him to go through the duties of his office, they diſpenſed with his reading of lectures, and his ſalary was continued. He continued, however, ſometimes to mount the chair; and although his lectures had now but little ſpirit in them, yet he had ſtill many hearers on account of his reputation. One day when the ſtudents were gone to ſome public ſhows, there were but 40 perſons in his auditory: which ſo mortified him, that he threw away his book; and crying out, "Aretin ſhall never explain law to a few perſons," retired in a paſſion, and would teach no more. He was ſevere in his temper, and never kept a ſervant longer than a month or two; for it was a maxim of his, "That new hired ſervants always ſerve beſt." He was honoured with the title of *knight*, and ſpent all his life in celibacy; and his way of living was ſo parſimonious, that he amaſſed a great deal of wealth. He had deſigned this wealth for the maintenance of a college; but he altered his reſolution, and left it to his relations.

(2.) ARETIN, Guido, a celebrated muſician, born at Arezzo, in Tuſcany, in the 13th century. Having been taught muſic in his youth, and probably retained as a choriſter in the ſervice of the Benedictine monaſtery in that city, he became a brother of the order of St Benedict. In this retirement he ſeems to have devoted himſelf to the ſtudy of muſic, particularly the ſyſtem of the ancients, and, above all, to reform their method of notation. The difficulties that attended the inſtruction of youth in the church offices were ſo great, that ten years were generally conſumed barely in acquiring the knowledge of the plain ſong; and this conſideration induced him to labour after ſome method that might facilitate inſtruction, and enable thoſe employed in the choral office to perform the duties of it in a correct manner. The legendary accounts that are extant in old monkiſh manuſcripts, ſay he was aſſiſted in his pious intention by immediate communication from heaven; and ſpeak of the invention of the ſyllables as the effect of *inſpiration*; and Guido himſelf ſays, it was revealed to him by the Lord; or, as ſome interpret his words, in a dream: but graver hiſtorians ſay, that being at veſpers in the chapel of his monaſtery, it happened that one of the offices appointed for that day was the hymn to St John, compoſed by Paul, a deacon of the church of Aquileia, about A. D. 770.

UT queant laxis - - - REſonare fibris
MIra geſtorum - - - FAmuli tuorum
SOLve polluti - - - LAbiis reatum,
Sancte Joanne.

Dunn

During the performance, he remarked the iteration of the words, and the frequent returns of UT, RE, MI, FA, SOL, LA: he obſerved likewiſe a diſſimilarity between the cloſeneſs of the ſyllable MI and the broad open ſound of FA, which he thought could not fail to impreſs upon the mind a laſting idea of their congruity; and immediately conceived a thought of applying theſe ſix ſyllables to perfect an improvement either then actually made by him, or under conſideration, viz. that of converting the ancient tetrachords into hexachords. Struck with the diſcovery, he retired to his ſtudy; and having perfected his ſyſtem, he communicated it to the brethern of his own monaſtery, from whom it met with but a cold reception, which in the epiſtle to his friend, he aſcribes undoubtedly to its true cauſe, envy. His intereſt, however, with the abbot, and his employment in the chapel, gave him an opportunity of *trying* the efficacy of this method on the boys who were training up for the choral ſervice, and it exceeded his moſt ſanguine expectation. "To the admiration of all, ſays cardinal Baronius, a boy thereby learnt, in a few months, what no man, though of great ingenuity, could before that attain in ſeveral years." The fame of Guido's invention ſoon ſpread abroad, and his method of *inſtruction* was adopted by the clergy of other countries. Kircher ſays that Hermanus biſhop of Hamburg, and Elviricus biſhop of Oſnaburg, made uſe of it; and by the authors of the *Hiſtoire Litteraire de la France*, that it was received in that country and taught in all the monaſteries in the kingdom. It is certain that the reputation of his great ſkill in muſic had excited in the pope a deſire to ſee him; of which, and of his going to Rome for that purpoſe, and the reception he met with from the pontiff, he himſelf has given a circumſtantial account. It ſeems that John XX. or as ſome writers ſtile him, the XIX. pope of that name, having heard of the fame of Guido, and deſiring to ſee him, ſent three meſſengers to invite him to Rome; upon their arrival, it was reſolved by the brethern of the monaſtery, that he ſhould be attended by Grimaldo the abbot, and Peter, the chief of the canons of the church of Arezzo. Arriving at Rome, he was received with great kindneſs. The pope had ſeveral converſations with him, in which he interrogated him as to his knowledge in muſic; and upon ſight of an antiphonary which Guido had brought with him, marked with the ſyllables agreeable to his new invention, the pope looked on it as a kind of prodigy; and ruminating on the doctrines delivered by Guido, would not ſtir from his ſeat till he had learned perfectly to ſing off a verſe; upon which he declared, that he could not have believed the efficacy of the method, if he had not be convinced by the experiment he had himſelf made of it. The pope would have detained him at Rome; but labouring under a bodily diſorder, and fearing any injury to his health from the air of the place, and the heats of the ſummer, then approaching, Guido left that city upon a promiſe to revifit it, and explain to his holineſs the principles of his new ſyſtem. On his return homewards, he made a viſit to the abbot of Pompoſa, a town in the territory of Ferrara, who was anxious that he ſhould ſettle in the monaſtery of that place: which invitation he accepted; and it was here that he compoſed a tract on muſic, intitled *Micrologus*, i. e. a ſhort diſcourſe; which he dedicated to Theodald biſhop of Arezzo. Voſſius ſpeaks of another muſical treatiſe written by him, and dedicated to the ſame perſon. Moſt authors who mention Guido, ſpeak of the Micrologus as containing the ſum of his doctrine: but it is in a ſmall tract, entitled *Argumentum novi Cantus inveniendi*, that his declaration of his uſe of the ſyllables, with their ſeveral mutations, and in ſhort his whole doctrine of *ſolmiſation*, is to be found. This tract makes part of an epiſtle to an intimate friend of Guido, whom he addreſſes, *Beatiſſimo atque dulciſſimo fratri Michaeli*, at whoſe requeſt it ſeems to have been compoſed. Whether Guido was the author of any other tracts, is not eaſy to determine. It nowhere appears that any of his works were ever printed, except that Baronius, in his *Annales Eccleſiaſtici, tom.* xi. *p.* 73, has given at length the epiſtle from him to his friend Michael of Pompoſa, and that to Theodald biſhop of Arrezzo, perfixed to the Micrologus; and yet the writers on muſic ſpeak of the Micrologus as a book in the hands of every one. Martini cites ſeveral manuſcripts of Guido; viz. two in the Ambroſian library at Milan, the one written about the 12th century, the other leſs ancient: another among the archives of the chapter of Piſtoja, a city in Tuſcany; and a fourth in the Mediceo-Laurenziano library at Florence, of the 15th century: theſe are clearly copies of the Micrologus. Of the epiſtle to Michael, with the *Argumetum novi Cantûs*, he mentions only one, which he ſays is ſomewhere at Ratiſbon. Of the ſeveral tracts abovementioned, the laſt excepted, a manuſcript is extant in the library of Baliol college in Oxford. Several fragments of the two firſt in one volume, are alſo among the Harleian manuſcripts now in the Britiſh Muſeum N° 3199; but ſo much mutilated, that they afford but ſmall ſatisfaction to a curious inquirer.

(3) ARETIN, Leonard, one of the moſt learned men of the 15th century, was ſecretary to the republic of Florence, and tranſlated from the Greek into Latin ſome of Plutarch's Lives, and Ariſtotle's Ethics: he alſo compoſed 3 books of the Punic war, as a ſupplement to thoſe wanting in Livy; the hiſtory of the tranſactions in Italy during his time; that of ancient Greece; that of the Goths; that of the republic of Florence; and many other books. He died in 1443, aged 74.

(4.) ARETIN, Peter, a native of Arezzo, who lived in the 16th century. He was famous for his ſatirical writings; and was ſo bold as to carry his invectives even againſt ſovereigns, and thus got the title of the *Scourge of Princes*. Francis I. the Emperor Charles V. moſt of the princes of Italy, ſeveral cardinals, and many noblemen, courted his friendſhip by preſents, either becauſe they liked his compoſitions, or perhaps from an apprehenſion of falling under the laſh of his ſatire. Aretin became thereupon ſo inſolent, that he is ſaid to have got a medal ſtruck, on one ſide of which he is repreſented with theſe words, IL DIVINO ARETINO; and on the reverſe, ſitting upon a throne, receiving the preſents of princes with theſe words, I PRINCIPI TRIBUTATI DA POPOLI,

TRIBUTANO IL SERVIDOR LORO. Some imagine that he gave himſelf the title of *Divine*, ſignifying thereby that he performed the functions of a god upon earth, by the thunderbolts with which he ſtruck the heads of the higheſt perſonages. He uſed to boaſt, that his lampoons did more ſervice to the world than ſermons; and it was ſaid of him, that he had ſubjected more princes by his pen than the greateſt heroes had ever done by their arms. Aretin, however, wrote many irreligious and obſcene pieces; ſuch are his dialogues, called *Ragionamenti*. There is likewiſe imputed to him another very obſcene performance, *De omnibus Veneris ſchematibus*. "It was about the year 1325 (ſays Mr Chevillier,) that Julio Romano, the moſt famous painter of Italy, inſtigated by the enemy of the ſalvation of mankind, invented drawings to engrave 20 plates: the ſubjects are ſo immodeſt that I dare not name them. Peter Aretin compoſed ſonnets for each figure. George Vaſari, who relates this in his Lives of the Painters, ſays, he does not know which would be the greateſt impurity, to caſt one's eyes upon the drawings of Julio, or to dip into the verſes of Aretin." Some ſay that Aretin changed his libertine principles; but however this may be, it is certain that he compoſed ſeveral devotional pieces. He wrote a Paraphraſe on the penitential Pſalms; another on Geneſis; with the lives of the Virgin Mary, St Catherine of Sienna, and St Thomas Aquinas. He was alſo author of ſome comedies. He died in 1556, about 65 years old.

ARETIUM, in ancient geography, one of the 12 cities of old Etruria. See AREZZO.

ARETOLOGI, in antiquity, a ſort of philoſophers, chiefly of the Cynic or Stoic tribe, who, having no ſchool or diſciples of their own, haunted the tables of great men, and entertained them in their banquets with diſputations on virtue, vice, and other popular topics. Theſe are ſometimes alſo denominated *Circulares Philoſophi*. In this ſenſe, the word is derived from the Greek, ἀρετὴ, *virtue*, and λογος, *diſcourſe*. Some authors derive it from ἀρεστὸς, *gratus*, "agreeable;" and define Aretologi, perſons who ſtrive to entertain their audience with jokes and pleaſant tales; which indeed ſeems the more natural explication.

* ARETOLOGY. *n. ſ.* [from ἀρετὴ, virtue, and λεγω, to diſcourſe.] That part of moral philoſophy which treats of virtue, its nature, and the means of arriving at it. *Dict.*

AREY-BECK, a village in Weſtmoreland, near Gowburrow park on the borders of Cumberland.

AREZZO, anciently ARETIUM, a city of Italy, in Tuſcany, ſeated in the territory of Florence, on the declivity of a mountain in the middle of a fruitful plain, 17 miles from Citta di Baſtella, and lying between it and Florence. It is an ancient city, and a biſhop's ſee; and was famous for a hand of earthern ware much eſteemed by the Romans. It was greatly fallen to decay when Coſmo de Medicis took it under his protection; ſince which it has been recovering gradually. It was the birth place of Mecænas. Lon. 12. 2. E. Lat. 43. 27. N.

ARF, afraid. *Chaucer.*

ARGA, a river of Spain, which waters Navarre, and falls into the Ebro.

* ARGAL. *n. ſ.* Hard lees ſticking to the ſides of wine veſſels, more commonly called tartar. *Dict.*

ARGAN, a town of New Caſtile.

ARGANIL, a town of Portugal, in Beira.

ARGATHELIA, the ancient name of ARGYLE.

ARGEA, or } in Roman antiquity, 30 human
ARGEI, } figures, made of ruſhes, thrown annually by the prieſts, or veſtals into the Tiber, on the day of the ides of May. Plutarch, in his Roman Queſtions, inquires why they were called *Argea*. Two reaſons are aſſigned; viz. 1. That the barbarous nation who firſt inhabited theſe parts, caſt all the Greeks, they could meet with into the Tiber; for Argians was a common name for all Grecians; but, that Hercules perſuaded them to quit ſo inhuman a practice, and to purge themſelves of the crime, by inſtituting this ſolemnity. 2. That Evander, an Arcadian, and a ſworn enemy of the Argians, to perpetuate that enmity to his poſterity, ordered the figures of Argians to be thus caſt into the river.

ARNEIA, or ARGOLIS, a diſtrict of Peloponneſus, ſituated between Arcadia on the W. the Egean Sea on the E. Laconia, and the Sinus Argoſicus on the S. and the territory of Corinth and the Sinus Saronicus on the N.; ſo called from Argos, the capital; now *Romania di Morea*.

ARGEII, or ARGIVI, (as the Romans called them, the ARGIVES, inhabitants of ARGEIA.—They were a colony who migrated, it is ſaid from Egypt, under the command of Inachus.—Polemon and Ptolemy Mendeſius, ancient Greek writers, inform us, that Inacus was contemporary with Amoſis, who demoliſhed Avaris, and expelled the ſhepherds out of Egypt. If, with ſome learned chronologers, we ſuppoſe Inachus to have begun to reform the Argives, A. A. C. 1856, and to have died A. A. C 1808, he muſt have been co-eval with Amoſis, who reigned in Upper Egypt, 15 years before the expulſion of the ſhepherds, and 10 years after that event, which happened A. A. C. 1806. Inachus was ſtyled the *Son of the Ocean*, becauſe of his unknown origin, or becauſe he had come by ſea into Greece. Before his arrival, the inhabitants were rude and barbarous. Theſe he united and civilized, and inſtructed in various arts. His ſon Phoroneus inſtituted the laws of government; and, on that account, has been called the *firſt king of Argos*, the *firſt of men*, and the *father of mortals*. The family of Inachus, after having kept poſſeſſion of the throne 347 years, were expelled by Danaus, who arrived, A. A. C. 1509, with a colony from Canaan. Acriſius, the laſt king of Argos, died A. A. C. 1313: and was ſucceeded by Perſeus, his grandſon, who transferred the ſeat of government to Mycenæ, 544 years from the firſt year of Inachus, in the reign of Cecrops II. king of Athens, and about the time when Pelops the ſon of Tantalus king of Phrygia, having been compelled by Ilus, to leave his native country, came into Greece, with great wealth, and acquired ſupreme power in the region afterwards called by his name. In the 37th year of Euryſtheus, grandſon of Perſeus, the Argonautic expedition happened, A. A. C. 1224. This unjuſt and tyrannical prince had aſſigned to Hercules his taſks; and

after

after the death of that hero, he baniſhed all his children. Theſe were the Heraclidæ who fled to *Athens* for protection, and who returned to Peloponneſus, 40 years after the deſtruction of Troy. In the reign of Agamemnon the Trojan war commenced; and it was carried on with vigour, during the ſpace of ten years. In A. A. C. 1184, Troy was taken, and the war was concluded.—Scarcely had the Grecians ſettled in their own country, after their return from this dangerous expedition, when the poſterity of Hercules invaded Peleponneſus, took poſſeſſion of it, and divided it among themſelves. Here the kingdom of Mycenæ ended, and that of Sparta was eſtabliſhed on its ruins. See SPARTA.

ARGEMA, or } in medicine, an ulcer about
ARGEMON, } the *iris* of the eye, comprehending part of the white, and part alſo of the black. The argemon appears of a red colour, on the outſide of the *iris*, and white within it. When it ſpreads far, and eats deep, it ſometimes occaſions the uvea to fall.

ARGEMONE, PRICKLY POPPY: A genus of the monogynia order, belonging to the polyandria claſs of plants; and in the natural method ranking under the 27th order, Rhœadeæ. The corolla conſiſts of ſix petals; the calyx is triphyllous; and the capſule is ſemi-valved. Of this genus there are 3 ſpecies, which are common in many parts of the Weſt Indies, and called by the Spaniards the *devil's fig*; but they are of no uſe, and have very little beauty.

ARGEMONION, in botany, a name given by ſome of the late Greek writers, to the plant called *ſarcocolla*, by the other writers of their times.

ARGENCES, a town of France, in the department of Calvados, 10 miles E. of Caen, ſeated on the Meance. Lon. 0. 10. W. Lat. 49. 15. N.

(1.) * ARGENT. *adj.* [from *argentum*, Lat. ſilver.] 1. The white colour uſed in the coats of gentlemen, knights, and baronets, ſuppoſed to be the repreſentation of that metal.—

In an *argent* field, the god of war
Was drawn triumphant on his iron car. *Dryd.*

2. Silver; bright like ſilver.—

Or aſk of yonder *argent* fields above,
Why Jove's ſatellites are leſs than Jove. *Pope.*

(2.) ARGENT, in heraldry, by itſelf, is uſed to ſignify purity, innocence, beauty, and gentleneſs; but according to G. Leigh, it ſignifies, when compounded with

Azure, — Courteſy; Sable, — Religion;
Gules, — Boldneſs; and
Purpure, — Favour; Vert, Virtue.

ARGENTA, a river of Albania.

ARGENTAC, a town of France, in the department of Upper Vienne, ſeated on the Dordogne, 15 miles SE. of Tulles, and 45 NW. of Aurillac. Lon. 2. 3. E. Lat. 45. 5. N.

ARGENTAN, a town of France, in the department of Orne, ſeated on an eminence, in the middle of a fertile plain, on the banks of the Orne. It carries on a conſiderable trade in corn, fine linen, lawns, gauzes, hats, leather, &c. It is ſituated 12 miles NW. of Seez, and 110 W. of Paris. Lon. 0. 5. E. Lat. 48. 54. N.

ARGENTANGINA, the ſilver quinſey: a diſeaſe to which a lawyer is liable, when, being feed by both parties, he pretends, while pleading at the bar, to be ſuddenly taken ill, in order to favour his client's opponent.

(1.) ARGENTARIA, a town of ancient Gaul, ſuppoſed to have been ſituated where COLMAR now ſtands. It is remarkable for a great victory gained by the emperor Gratian over the Lentienſes, in May, A. D. 378. The Romans being but few in number, were at firſt overpowered, and obliged to give ground; but ſoon returning to the charge, they gained in the end a complete victory; 30,000 barbarians, with their king Triarius, being killed on the ſpot; and all the reſt, except 5000, taken priſoners.

(2.) ARGENTARIA CRETA, ſilver chalk, in natural hiſtory, a very beautiful earth, of a looſe friable texture, and perfectly white. It is not properly a chalk, but a ſpecies of *tripela*; dug in Pruſſia, and is much eſteemed for cleaning plate. It has alſo been found in France, and of late in Ireland. The ſpecies dug at Mantua is much uſed by painters, and at Rome is vulgarly called *geſſo*.

(1.) ARGENTARIUS, in civil law, one who adorned military arms with ſilver or gold.

(2.) ARGENTARIUS, in Roman antiquity, a money changer or banker. The argentarii were monied people, who made a profit either by the changing, or lending of money at intereſt. They had their *tabernæ*, or offices, in the *Forum Romanum*, built there as early as the reign of Tarquin I. The argentarii and ſœneratores were hated for their covetouſneſs and extortion.

(3.) ARGENTARIUS, in writers of the middle age, an officer entruſted with the cuſtody of money. In this ſenſe *argentarius* amounts to the ſame with the Greek ἀργυροταμίας, and our *caſhier*.

(4.) ARGENTARIUS MILES, in our old writers, an officer of the exchequer, whoſe buſineſs it was to carry up the bag of money from the lower exchequer to the higher, in order to its being examined or told.

ARGENTARO, MONTE, a cape and promontory of Italy, on the coaſt of Tuſcany, 12 miles S. of Orbitello. It juts out into the ſea like a peninſula, and is a uſeful land mark.

ARGENTATI MILITES, in antiquity, and mentioned by Livy, (*lib.* vi.) are diſtinguiſhed from *aurati*. Aquinas ſuppoſes theſe to have been ſimilar to the argyraſpides and chryſalpides; but the deſcriptions do not quadrate. Livy only repreſents the argentati as clothed in white linen coats.

* ARGENTATION. *n. ſ.* [from *argentum*, Lat. ſilver.] An overlaying with ſilver. *Dict.*

ARGENTEUIL, a town of the Iſle of France, ſeated on the Seine, five miles NW. of Paris.—It is a beautiful place, with fine vineyards. In the environs are quarries of ſtucco. In the ci-devant Benedictine priory, they pretend to have the ſeamleſs coat of Chriſt. Lon. 2. 28. E. Lat. 48. 52. N.

ARGENTUM OS, in natural hiſtory. See Os ARGENTUM.

ARGENTEUS CODEX, a MS. copy of the four goſpels, ſo named from its ſilver letters. The leaves are parchment violet coloured, and on this ground the letters, which are all capitals, have

been painted in silver, except the initials, and a few passages in gold. It is supposed to be a copy of the Gothic version, made by Ulphilas, the apostle of the Goths, in the 4th century. It is now in the university of Upsal. It is a 4to size.

ARGENTICOMUS, among ancient astrologers, denotes a kind of silver haired comet, of uncommon lustre, supposed to be the cause of great changes in the planetary system.

ARGENTIERA, or (1.) ARGENTIERE, a small island in the Archipelago, near Milo, so named from its silver mines. It is about 18 miles in circumference, full of barren mountains, producing nothing but barley, cotton, and a few grapes, fit only for eating. The barley and cotton are sown round the only village in the island. The ladies are handsome, have no other employment but making cotton stockings, and take up with the sailors who come into the port.—The men all frequent the sea, and in time become good pilots. They have little religion, are very ignorant, and of bad morals. Justice is administered by an itinerant cadi, who is sometimes the only mussulman in the whole island. It produces the TERRA CIMOLIA, so highly esteemed by the ancients. See CIMOLIA. Lon. 23. 10. E. Lat. 36. 50. N.

(2.) ARGENTIERE, a town of France, in the department of Ardeche, 5 miles SW. of Aubenas, and 17 W. of Viviers. Lon. 4. 22. E. Lat. 44. 30. N.

ARGENTIL, an old English name for the plant called *percipier Anglorum*; in English, parsley piert, or parsley break-stone. See APHANES.

(I.) ARGENTINA, in botany, a medicinal plant, nearly resembling cinquefoil, of some use as a cooler and astringent.

(II.) ARGENTINA, in ichthyology, a genus of fishes belonging to the order of abdominales.—The generic characters are these: The teeth are in the tongue, as well as the jaws; the bronchiostege membrane has eight radii or rays; the anus is near the tail; and the belly fins consist of many rays. There are two species of argentina, viz.

1. ARGENTINA CAROLINA has 15 rays in the fin near the anus; the tail is forked, and the lateral lines are straight. It inhabits the fresh waters of Carolina.

2. ARGENTINA SPHYRÆNA has likewise 15 rays in the fin at the anus; the air bladder of this species is conical on both sides, and shines like silver: false pearls are sometimes made of it.

(III.) ARGENTINA. See ARGENTORA.

ARGENTINE, a town of France, in the department of Mont Blanc.

ARGENTINUS, a deity worshipped by the ancients, as the god of silver coin; as Æsculanus, whom they made his father, was the god of brass money, which was in use before silver.

ARGENTON, a town of France, in the department of the Indre. It is divided into two by the river Creuse. It had formerly a castle; but it was demolished by Lewis XIV. Lon. 1. 38. E. Lat. 46. 36. N.

ARGENTORA, ARGENTORATUM, ARGENTORATUS, an ancient city of the Tribocci, called also ARGENTINA. It was one of the 50 forts built by Drusus on the Rhine. The name was formed by the Romans from the German, *Argen Strassen*, or *Straten*, "unsafe roads for travellers," from the marauding parties of the garrisons that infested the roads. It is now called *Strasburg*, and is comprehended in the department of the Lower Rhine; being situated on the rivulet Il, near the Rhine. See STRASBURG. Lon. 7. 35. E. Lat. 48. 38. N.

ARGENTRE, Charles Dupleſſis d'; a learned French prelate, was born in 1673. By his labours and learning he became doctor of the Sorbonne, almoner to the king, and bishop of Tulles. Among his numerous works the most interesting is, his *Collectio Judiciorum de novis erroribus*, &c. in 3 vols. folio; containing nearly the same materials as Bossuet's large work, *L'Histoire des Variations*. Argentre died in 1740.

ARGENTUM. See SILVER.

ARGENTUM ALBUM, in our old customs, silver coin, or pieces of bullion that anciently passed for money. By Doomsday tenure, some rents to the king were paid in *argento albo*, common silver pieces of money: other rents in *libris ursis et pensatis*, in metal of full weight and purity: in the next age, that rent which was paid in money, was called *blanch farm*, and afterwards *white rent*; and what was paid in provisions, was termed *black mail*.

ARGENTUM DEI, GOD'S PENNY, anciently signified earnest money, or money given to bind a bargain; in some places called *erles*, or *orles*, and by the civilians and canonists, *arrhæ*. *Et cepit de prædicto Henrico tres denarios de argenti Dei pre manibus*.

ARGENTUM MOSAICUM, or ARGENTUM MUSIVUM, a mass consisting of silver-like flakes, used for the colouring of plaster figures, and for other purposes, as pigment. It consists of an amalgam of equal parts of tin, bismuth, and mercury. It is to be mixed with white of egg, or spirit varnish, and then applied to the intended work, which is afterwards to be burnished.

ARGENTUM VIVUM, mercury or quicksilver. See MERCURY, and CHEMISTRY, INDEX.

ARGENVILLE, Anthony Joseph Dezallier d'; an ingenious French writer, was the son of a bookseller in Paris. He became a member of several societies in Europe. He was author of a treatise on Gardening, 4to, 1747; the Lives of the most famous Painters, 4to, 1755; a Catalogue of Fossils found in France; and other curious works. He also wrote for the Encyclopedie. He died in 1766.

ARGESTES, is used by Vitruvius for the wind which blows from that quarter of the horizon, which is 75° from the south, and westward. Riccioli uses the term to denote the wind which blows at 22° 30′ from the west towards the north, coinciding with that which is commonly called *west-north-west*.

ARGETENAR, in astronomy, a star of the fourth magnitude, in the flexure of the constellation Eridanus.

ARCHOLME, a village in Lancashire, near Cartmel.

ARGIA, in the mythology, 1. the wife of Inachus, and mother of Io, or Isis; 2. the daughter of

of Adraſtus, wife of Polynices, and mother of Theriſander, one of the Epigoni: 3. the mother of Argus, the carpenter of the ſhip Argo.

ARGIA AMPHILOCHUS. See ARGOS AMPHILOCHICUM.

(1.) ARGIL, in ornithology, a ſpecies of ardea. See ARDEA, N° II. § 2.

(2.) * ARGIL. *n. ſ.* [*argilla*, Lat.] Potter's clay; a fat ſoft kind of earth of which veſſels are made.

(3.) ARGIL, or ARGILLA, } in natural hiſtory. See CLAY.

* ARGILLACEOUS. *adj.* [from *argil.*] Clayey; partaking of the nature of argil; conſiſting of argil, or potter's clay.

ARGILLACEOUS EARTHS, ſuch as form with water a tenaceous paſte, or ſoft ſtones; they burn hard, are corroded by ſtrong coction in the concentrated mineral acids, but not acted upon by moderate digeſtion. They are the baſis of earthen wares. They vitrify with ſalts, with arſenic, with gypſum, and difficultly with lead.

* ARGILLOUS. *adj.* [from *argil.*] Conſiſting of clay; clayiſh; containing clay.—Albuquerque derives this redneſs from the ſand and *argillous* earth at the bottom. *Brown's Vulgar Errours.*

ARGIPPA. See ARGOS HIPPIUM, N° 2.

ARGIVES, } the people of Argeia. See ARGEII.
ARGIVI, } Alſo a name for the Greeks in general.

(1.) ARGO, in fabulous hiſtory, the ſhip, celebrated by the poets, wherein the Argonauts, of whom Jaſon was the chief, ſailed in queſt of the golden fleece. Jaſon having happily accompliſhed his enterpriſe, conſecrated the ſhip Argo to Neptune; or, as others ſay, to Minerva, in the iſthmus of Corinth; where they add, it did not remain long before it was tranſlated into heaven, and made a conſtellation. The generality of authors repreſent the ſhip Argo as of a long make, reſembling the modern galleys; and furniſhed with 30 benches of rowers. It could not, however, be of any great bulk, ſince the Argonauts were able to carry it on their backs from the Danube to the Adriatic ſea. See ARGONAUTS, N° I, § 1—3.

(2.) ARGO, or ARGO NAVIS, in aſtronomy, the *Ship Argo*, is a conſtellation in the ſouthern hemiſphere, whoſe ſtars, in Ptolemy's catalogue, are 45; in Tycho's, 2; in the Britannic catalogue, and Sharp's appendix, 64.

(3.) ARGO. See ARGONAUTA, N° 1.

ARGOB, in ancient geography, a canton lying beyond Jordan, in the half tribe of Manaſſeh, and in the country of Baſhan, one of the moſt fruitful on the other ſide of Jordan. In the region of Argob there were 60 cities, called *Baſhan-havoth-jair*, which had very high walls and ſtrong gates, without reckoning many villages and hamlets which were not incloſed, Deut. iii. 4. 14. and 1 Kings iv. 13. The capital city of the region of Argob, which Euſebius ſays was 15 miles W. from Gerafa.

ARGOIL, clay. *Chaucer.* See ARGIL, N° 2.

(1.) ARGOL, or ARCHIL. See ARCHIL.

(2.) ARGOL, or ARGAL, tartar. See ARGAL.

ARGOLETIERS, light armed horſemen.

(1.) ARGOLI, Andrew, an Italian mathematician, was born at Tagliocozzo, in the kingdom of Naples. In 1626 the ſenate of Venice appointed him profeſſor of Mathematics at Padua, with the title of chevalier. He died in 1653. He publiſhed a treatiſe *De Diebus Criticis*, in 4to. 1652, and Ephemerides, from 1640 to 1700.

(2.) ARGOLI, John, ſon of the above, was profeſſor of Juriſprudence at Bologna. He wrote a poem, which is much admired, entitled, Endymion, and other works. He died about 1660.

ARGOLIS. See ARGEIA.

ARGONAUTA, the name of a ſpecies of ſhell-fiſh belonging to the order of vermes teſtacea. The ſhell conſiſts of one ſpiral involuted valve. There are two ſpecies, viz.

1. ARGONAUTA ARGO, with a ſubdented carina, is found in the Mediterranean and Indian oceans. This is the famous *nautilus* of authors. The ſhell ſeems no thicker nor ſtronger than a piece of paper; and the fiſh that inhabits it is a ſepia. It has been imagined that men firſt learned the method of ſailing in veſſels from what they ſaw practiſed by this creature. When it is to ſail, it extends two of its arms on high; and between theſe ſupports a membrane, which it throws out on this occaſion: this ſerves it for its ſail; and the two arms it hangs out of the ſhell, to ſerve occaſionally either as oars or as a ſteerage; but this laſt office is generally ſerved by the tail. When the ſea is calm, it is common to ſee numbers of theſe creatures diverting themſelves with ſailing about in this manner; but as ſoon as a ſtorm riſes, or any thing gives them diſturbance, they draw in their legs, and take in as much water as makes them ſomewhat heavier than the ſea-water in which they ſwim, and they then ſink to the bottom. The manner of their voiding this abundant water, when they would riſe again, is by a number of holes, of which their legs are full.

2. ARGONAUTA CYMBIUM has a blunt plaited carina. This ſpecies is very ſmall, and is found in the Mediterranean.

ARGONAUTIC, ſomething belonging to the Argonauts. The argonautic expedition is one of the great epochas, or periods of ancient hiſtory, which Sir Iſaac Newton endeavours to ſettle, and from thence to rectify the ancient chronology. This he ſhows, by ſeveral authorities, to have been one generation, or about 30 years earlier, than the taking of Troy, and 43 years later than the death of Solomon. See CHRONOLOGY. Dr Bryant, however, rejects the hiſtory of the Argonautic expedition as a Grecian fable, founded on a tradition derived from Egypt, and ultimately referring to Noah's preſervation, &c. in the ark. But although we are not to believe all the romantic ſtories which poets, and even ſome grave hiſtorians, have told us of thoſe famous adventurers, yet it ſeems unreaſonable to diſcredit entirely the Argonautic expedition. See ARGONAUTS, N° I, § 2—7.

ARGONAUTICA, in literary hiſtory, poems on the expedition of the Argonauts. We have the *Argonautics* of Orpheus in epic verſe, publiſhed by H. Stephens, the *Argonautics* of Apollonius Rhodius, an heroic poem, conſiſting of 4 books, "a work," as Quintilian ſays, "by no means contemptible;" and the *Argonauticon* of Valerius Flaccus, in 8 books of Latin heroics, in imitation of Apollonius; with reſpect to which Burman obſerves,

ſerves, that the imitator has often ſurpaſſed the original.

(I. 1.) ARGONAUTS, in antiquity, a company of 51 heroes, according to Valerius Flaccus, or, according to Apollonius Rhodius, of 44, who embarked along with Jaſon in the ſhip ARGO, for Colchis, to obtain the golden fleece. But Julius Hyginus, who gives a liſt of them with their genealogies, enumerates no fewer that 69 Argonauts. Hercules, Theſeus, Caſtor, Pollux, Amphion, Telamon, Meleager, &c. were of the number. Calais and Zethes, the ſons of Boreas, who were ſaid to have had wings at their head and feet, were their pilots. Jaſon, according to the fable, before he could obtain the golden fleece, had to engage its guardians, a monſtrous dragon, and 2 bulls with brazen feet, which breathed fire from their noſtrils: all which prodigies he performed by the help of Medea, daughter of Æetes king of Colchis, and carried off both the fleece and the princeſs!

(2.) ARGONAUTS, EXPEDITION OF THE, EXPLAINED. The occaſion of this expedition is thus repreſented by Greek writers. Phryxus, flying with his ſiſter Helle from the rage of their ſtepmother Ino, the daughter of Cadmus, went on board a ſhip, whoſe enſign was a *golden ram*, and ſailed to Colchis, now Mingrelia, part of Georgia. Helle was drowned by the way, in that ſea which from her was called the *Helleſpont*; now the *Dardanelles*. This, according to ſome, was the ground of the poetical fable, that a ram with a golden fleece ſwam away with them to Colchis; and that the Argonauts undertook their famed expedition, in order to find that fleece. But Strabo and Arrian inform us, that it was a practice of the Colchians to collect gold on mount Caucaſus by extending fleeces acroſs the beds of the torrents; and as the water paſſed, the metallic particles remained entangled in the wool: hence, according to thoſe hiſtorians, the adventure was named the *expedition of the golden fleece*. Sir Iſaac Newton thinks that this expedition was really an embaſſy ſent by the Greeks, during the inteſtine diviſions of Egypt in the reign of Amenophis, to perſuade the nations upon the coaſts of the Euxine and Mediterranean ſeas, to take that opportunity of ſhaking off the yoke of Egypt, which Seſoſtris had laid upon them; and that fetching the golden fleece, was only a preſence to cover their true deſign.

(3.) ARGONAUTS, MOST PROBABLE ACCOUNT OF THE. The moſt judicious and ſatisfactory account of the Argonautic expedition ſeems to be that given by Dr Gillies in his hiſtory of Greece. "The northern diſtricts of Theſſaly being peculiarly expoſed to the dangerous fury of invaders, the petty princes of that province entered into a confederacy for their mutual defence. They aſſembled in ſpring and autumn at Thermopylæ, a place afterwards ſo illuſtrious, and then governed by Amphictyon, a deſcendant of Deucalion, whoſe name is immortalized in the Amphictyonic council. The advantages which the confederates derived from this meaſure, were ſoon perceived by their neighbours. The central ſtates gradually acceded to their alliance; and about the middle of the 14th century before Chriſt, Acriſius king of Argos, and other princes of the Peloponneſus, were allowed to ſhare the benefits and ſecurity of this uſeful aſſociation." (See AMPHICTYONS.) "After this event, the Amphictyons appear to have long confined themſelves to the original purpoſe of their inſtitution. The ſtates, whoſe meaſures were directed by this aſſembly, found ſufficient occupation in defending their own territories; and near a century elapſed, before they undertook, by common conſent, any diſtant expedition. But it was not to be expected that their reſtleſs activity could be always exhauſted in defenſive war. The eſtabliſhment of the Amphictyons brought together the chiefs moſt diſtinguiſhed by birth and bravery. Glory and emulation prompted them to arms, and revenge directed thoſe arms againſt the barbarians. Jaſon, Admetus, and other chieftains of Theſſaly, having equipped a ſmall fleet in the neighbouring harbour of Ioleus, and particularly the ſhip Argo, of ſuperior ſize and conſtruction to any before known, were animated with a deſire to viſit foreign lands, to plant colonies in thoſe parts of them that appeared moſt delightful, and to retort on their inhabitants the injuries which Greece had ſuffered from ſtrangers. The princes of the north having proclaimed this ſpirited deſign over the central and ſouthern provinces, the ſtandard of enterprize and glory was ſpeedily ſurrounded by the flower of the Grecian youth, who eagerly embraced this honourable opportunity to ſignalize their manly valour. Peleus, Tydeus, Telamon, and in general the fathers of theſe heroic chiefs, who in the ſucceeding age ſhone with diſtinguiſhed luſtre in the plains of Troy, are numbered among the leaders of the Argonauts. They were accompanied by the choſen warriors, and by the venerable prophets of their reſpective tribes; by an Eſculapius, the admired father of the healing art; and by the divine Orpheus, whoſe ſublime genius was worthy to celebrate the amazing ſeries of their adventures. Theſe adventures, however, have been too much adorned by the graces of poetry, to be the proper ſubjects of hiſtorical compoſition. The deſigns of the Argonauts are veiled under the allegorical, or at leaſt doubtful, phraſe, *of carrying off the golden fleece*; which, though eaſily explained, if we admit the report that the inhabitants of the eaſtern banks of the Euxine extended fleeces of wool, in order to collect the golden particles, which were carried down by the torrents from Mount Caucaſus, is yet deſcribed in ſuch various language by ancient writers, that almoſt every modern who examines the ſubject, thinks himſelf intitled to offer, by way of explanation, ſome new conjecture of his own. But in oppoſition to the moſt approved of theſe conjectures, we may venture to affirm, that the voyage to Colchis was not undertaken with a view to eſtabliſh extenſive plans of commerce, or to ſearch for mines of gold, far leſs to learn the imaginary art of converting other ſubſtances into that precious metal; all ſuch motives ſuppoſing a degree of ſpeculation and refinement, unknown in that age, to the gallant but uninſtructed youth of Theſſaly. The real object of the expedition may be diſcovered by its conſequences. The Argonauts fought, conquered, and plundered; they ſettled a colony on the ſhores of the Euxine;

Euxine; and carried into Greece a daughter of the king of Colchis, the celebrated Medea, a princeſs of Egyptian extraction, whoſe crimes and enchantments are condemned to eternal infamy in the immortal lines of Euripides."

(II.) ARGONAUTS OF ST NICHOLAS, a military order, inſtituted by Charles III. king of Naples, in 1382, for the advancement of navigation, or, as ſome ſay, merely for preſerving amity among the nobles. They wore a collar of ſhells, incloſed in a ſilver creſcent, whence hung a ſhip with this device, *Non credo tempori*, "I do not truſt time." Hence theſe Argonaut knights came to be called *knights of the ſhell*. They received the order of St Baſil, archbiſhop of Naples; and held their aſſemblies in the church of St Nicholas, their patron.

ARGONNE, a ci-devant province, or territory of France, comprehending all that part of the country, that lies between the rivers Meuſe, Marne, and Aine. St Menehold was the capital.

ARGOPHYLLUM, WHITE-LEAF. A genus of the monogynia order, belonging to the pentandria claſs of plants. The capſule is trilocular; the nectarium is pyramidal, pentagonous, and the length of the corolla. There is but one ſpecies, viz.

ARGOPHYLLUM NETIDUM, or the gloſſy argophyllum, a native of New Caledonia. This ſpecies has great affinity with the ivy; but differs in the nectarium, and perhaps in the fruit.

(I.) ARGOS, an ancient name of Peloponneſus; ſo called from Argus, one of its kings.

(II. 1.) ARGOS, an inland town, and the capital of Argolis or ARGEIA. It had different epithets; as ACHAICUM, from the country, or the original people; HIPPIUM, from its breed of horſes; and INACHIUM, from the river Inachus, which runs by, or from Inachus the founder of the kingdom, whoſe name was given to the river; and whoſe queen Argia, gave name to the country, Argeia. The Argives related, that Inachus was one of the river gods who adjudged the country to Juno, when ſhe contended for it with Neptune, which deity in return made their water to vaniſh; the reaſon why the Inachus flowed only after rain, and was dry in ſummer. The ſource was a ſpring, not copious, on a mountain in Arcadia, and the river ſerved there as a boundary between the Argives and Mantineans.

(2.) ARGOS, ANCIENT DESCRIPTION OF. Argos ſtood chiefly on a flat. The ſprings were near the ſurface; and it abounded in wells, which were ſaid to have been made by the daughters of Danaus. This ancient perſonage lived in the acropolis or citadel, which was named *Lariſſa*, and accounted moderately ſtrong. On the aſcent was a temple of Apollo on the ridge, which in the 2d century continued the ſeat of an oracle. The woman who propheſied was debarred from commerce with the male ſex. A lamb was ſacrificed once a month, in the night, when, on taſting of the blood, ſhe became poſſeſſed with the divinity. Farther on was a ſtadium, where the Argives celebrated games in honour of Neméan Jupiter and of Juno. On the top was a temple of Jupiter, without a roof, the ſtatue off the pedeſtal. In the temple of Minerva, among other curious articles, was a wooden Jupiter, with an eye more than common, having one in the forehead. This ſtatue, it was ſaid, was once placed in a court of the palace of Priam, who fled as a ſuppliant to the altar before it when Troy was ſacked. In this city was alſo the brazen tower in which Danäe, the daughter of king Acriſius, being confined there by her father, was deſtroyed by Jupiter, or more probably one of his prieſts.

(3.) ARGOS, PRESENT STATE OF. Argos retains its original name and ſituation, ſtanding near the mountains which are the boundary of the plain, with Napoli di Romania, and the ſea in view before it. The ſhining houſes are whitened with lime or plaſter. Churches, mud-built cottages and walls, with gardens and open areas, are interſperſed, and the town is of conſiderable extent. Above the other buildings a very handſome moſque is ſeen, ſhaded with cypruſſes; and behind is a lofty hill, brown and naked, of a conical form, the ſummit crowned with a neglected caſtle. The devaſtations of time and war have effaced the old city. We look in vain, ſays Mr Chandler, for veſtiges of its numerous edifices, the theatre, the gymnaſium, the temples, and monuments, which it once boaſted, contending even with Athens in antiquity and in favours conferred by the gods. It is ſituated 25 miles S. of Corinth. Lon. 1. 31. E. Lat. 56. 51. N. according to ſome; but Mr Walker places it in Lon. 23. 5. E. and Lat. 37. 30. N.

(III.) ARGOS, [ἄεργος, from α negative, and ἔργον, *work* or *buſineſs*; as if it were ἀεργὸς,] any thing not prepared. Thus ἄεργος ἄεργυρος is ſilver not worked; ἀεργὸν πυρὸν, in Hippocrates, is crude wheat not prepared, but ſuch as it is taken from the floor.

ARGOS ACHAICUM. See ARGOS, N° II. § 1.

ARGOS AMPHILOCHICUM, a city of Acarnania, ſituated on the E. ſide of the Sinus Ambracius 180 ſtadia SE. of Ambracia. It was ſo named from AMPHILOCHUS the ſon of Amphiaraus, and ARGOS, his country. See N° 1. It was alſo called ARGIA AMPHILOCHIS, and AMPHILOCHIA.

(1.) ARGOS HIPPIUM. See ARGOS, N° II. § 1.

(2.) ARGOS HIPPIUM, an ancient name of Arpi; afterwards called *Argyrippa*, and *Argippa*; built by Diomedes, on the Cerbalus. It was a large and populous city of Apulia; and is now called ARPI, but in ruins.

ARGOS INACHIUM. See ARGOS, N° II. § 1.

ARGOS PELASGICUM, Theſſaly; ſo called from the Pelaſgi.

ARGOS PORTUS, a port of Tuſcany; now called PORTO FERRARO, in the N. of the iſland Elba. Lon. 11. 30. E. Lat. 42. 35. N.

ARGOSIES. See ARGOSY.

ARGOSTOL, or } a ſea port of Cephalonia,
ARGOSTOLI, } oppoſite to Albanica. It is the beſt harbour in the iſland. It is 5 miles diſtant from the fortreſs, where the proveditor reſides.

* ARGOSY. *n.ſ.* [derived by Pope from *Argo*, the name of Jaſon's ſhip; ſuppoſed by others to be a veſſel of *Raguſa* or *Ragoſa*, a *Ragouzine*, corrupted]

rupted.] A large veſſel for merchandize; a carrack.—

Your mind is toſſing on the ocean;
There where your *argoſies* with portly ſail,
Like ſigniors and rich burghers on the flood,
Do overpeer the petty traffickers. *Shak.*

ARGOW, or AARGOW, a county of Switzerland, adjacent to the Aar, whence its name.

* (1.) *To* ARGUE. *v. a.* 1. To prove any thing by argument.—

If the world's age and death be *argued* well,
By the ſun's fall, which now towards earth doth bend,
Then we might fear that virtue ſince ſhe fell
So low as woman ſhould be near her end.
Donne.

2. To debate any queſtion; as, to *argue* a cauſe.

3. To prove, as an argument.—

So many laws *argue* ſo many ſins
Among them: how can God with ſuch reſide?
Milton.

4. To charge with, as a crime: with *of*.—I have pleaded guilty to all thoughts and expreſſions of mine, which can be truly *argued of* obſcenity, profaneneſs, immorality, and retract them. *Dryden.*

* (2.) *To* ARGUE. *v. a.* [*arguo.* Lat.] 1. To reaſon; to offer reaſons.—

I know your majeſty has always lov'd her
So dear in heart, not to deny her what
A woman of leſs peace might aſk by law;
Scholars allow'd freely to *argue* for her. *Shak.*

2. To perſuade by argument.—It is a ſort of poetical logick which I would make uſe of, to *argue* you into a protection of this play. *Congr. Ded. to Old Bat.* 3. To diſpute; with the particles *with* or *againſt* before the opponent, and *againſt* before the thing oppoſed.—Why do Chriſtians, of ſeveral perſuaſions, ſo fiercely *argue againſt* the ſalvability of each other? *Decay of Piety.*—I do not ſee how they can *argue with* any one, without ſetting down ſtrict boundaries. *Locke.*

ARGUED, *part.* [from *argue.*] Proved, debated.

* ARGUER. *n. ſ.* [from *argue.*] A reaſoner; a diſputer; a controvertiſt.—Men are aſhamed to be proſelytes to a weak *arguer*, as thinking they muſt part with their reputation as well as their ſin. *Decay of Piety.*

ARGUIM, or (I. 1.) ARGUIN, } an iſland on the coaſt of Africa, about 16, or as others ſay, 30 miles from Cape Blanco, ſcarce two miles in length; notwithſtanding of which, it was a bone of contention for 87 years between the Portugueſe, Dutch, Engliſh and French; and, after a variety of fortune, has at laſt been totally abandoned. Lon. 17. 20. W. Lat. 20. 30. N. according to Walker; but others place it in Lon. 3. 20. E.

(2.) ARGUIN, HISTORY OF. This iſland was firſt diſcovered by the Portugueſe in 1444, when a fleet bound to the eaſt touched at Arguim, and from ſome little trade carried on with the natives, it was imagined that a ſettlement there might be of ſome advantage to Portugal. A fort was accordingly erected on the iſland, and the Portugueſe enjoyed the peaceable poſſeſſion of it till 1638. At this time, the Dutch having received a minute account of the condition of the iſland, reſolved to attack it; and accordingly landed without moleſtation from the garriſon, which was too weak to oppoſe them. The Portugueſe, however, defended themſelves with great intrepidity, and at laſt ſurrendered upon honourable terms. The Dutch immediately ſet about repairing the fortifications, and ſecuring it in the beſt manner they could: however, in 1665, the fort was reduced almoſt to a heap of rubbiſh by an Engliſh ſquadron; but as the fortifications were totally deſtroyed, and only a ſmall garriſon left there, it was eaſily retaken by the Dutch the next year. They now redoubled their diligence in ſtrengthening the iſland, entering into alliance with Mooriſh chiefs, procuring a number of families to ſettle under protection of the fort, and giving extravagant prices for gums, in order to monopolize the gum trade. By this means the gum trade of the French Senegal company was almoſt entirely deſtroyed; upon which they fitted out a ſquadron, diſpoſſeſſed the Dutch, and had the iſland finally ceded to them by the treaty of Nimeguen. Though the Dutch now ſeemed finally to be expelled, they reſolved not to part ſo eaſily with ſuch a valuable ſettlement. Under pretence of being ſubjects of the Elector of Brandenburg, therefore, they erected one of the forts which had been demoliſhed, and there maintained themſelves in ſpite of the utmoſt endeavours of the French company to diſpoſſeſs them. Numberleſs were the memorials, proteſts, reſcripts, &c. which were publiſhed on this occaſion, till a new war in 1701 put an end to them. In 1717, however, the French company having found all their remonſtrances ineffectual, fitted out a new ſquadron; but this armament did not arrive at Arguim before February 26th, 1721. The Dutch defended themſelves with ſuch intrepidity as had almoſt baffled the utmoſt efforts of the French; but the latter having drawn off a Mooriſh chief from his alliance, the Dutch were obliged to evacuate Arguim, and retire to Portendic, where they fortified themſelves, determining to watch a favourable opportunity for recovering their ſettlement at Arguim. This ſoon occurred, by the imprudence of Duval the French director; who having quarrelled with the Moors, was ſurpriſed, defeated, and killed by them; in conſequence of which, the ſettlement fell again into the hands of the Dutch on the 11th of June 1722. In 1725, the Dutch were attacked by another French ſquadron under the command of the Sieur Riguadiere, who boaſted that the fort could not hold out one day; but though he prevailed ſo far as to get poſſeſſion of the ciſterns which contained the water of the beſieged, he was at laſt ſhamefully repulſed, and forced to raiſe the ſiege with precipitation. The Dutch, however, did not long enjoy the poſſeſſion which they had ſo bravely defended; for, in 1725, their fort was entirely demoliſhed by the French under Du Caſſe, and has never ſince been rebuilt.

(II.) ARGUIN, a river in the iſle of Arguin.

(1.) * ARGUMENT. *n. ſ.* [*argumentum*, Lat.] A reaſon alledged for or againſt any thing.—We ſometimes ſee, on our theatres, vice rewarded, at leaſt unpuniſhed; yet it ought not to be an *argument* againſt the art. *Dryden.* 2. The ſubject of any diſcourſe or writing.—

To

To the height of this great *argument*
I may assert eternal providence,
And justify the ways of God to man. *Milton.*

§. The contents of any work summed up by way of abstract.—The *argument* of the work, that is, its principal action, the œconomy and disposition of it, are the things which distinguish copies from originals. *Dryden.* 4. A controversy.—If the idea be not agreed on betwixt the speaker and hearer, the *argument* is not about things, but names. *Locke.* 5. It has sometimes the particle *to* before the thing to be proved, but generally *for*.—The best moral *argument to* patience, in my opinion, is the advantage of patience itself. *Tillotson.*—This, before that revelation had enlightened the world, was the very best *argument for* a future state. *Atterbury.* 6. [In astronomy.] An arch, by which we seek another unknown arch, proportional to the first. *Chambers.*

(1.) ARGUMENT, in literature. See § 1. Def. 2, and 3; and SYLLABUS.

(3.) ARGUMENT, in logic, and rhetoric, an inference drawn from premises, the truth of which is indisputable, or at least highly probable. See LOGIC.

ARGUMENT OF INCLINATION, in astronomy, is an arch of a planet's orbit intercepted between the ascending node, and the place of the planet from the sun, numbered according to the succession of the signs.

ARGUMENT OF THE MOON'S LATITUDE is the distance of the moon's true place from the sun's. By this we find the quantity of the real obscuration in eclipses, or how many digits are darkened in any place.

* ARGUMENTAL. *adj.* [from *argument*.] Belonging to argument; reasoning.—

Afflicted sense thou kindly dost set free,
Oppress'd with *argumental* tyranny,
And routed reason finds a safe retreat in thee.
Pope.

(1.) * ARGUMENTATION. *n. f.* [from *argument*.] Reasoning; the act of reasoning. *Argumentation* is that operation of the mind, whereby we infer one proposition from two or more propositions premised. Or it is the drawing a conclusion, which before was unknown, or doubtful, from some propositions more known and evident; so when we have judged that matter cannot think, and that the mind of man doth think, we conclude, that therefore the mind of man is not matter. *Watt's Logick.*

(2.) ARGUMENTATION, according to Cicero, is the delivering or unfolding of an argument.—The matter of argumentations is propositions; the form, their due disposition, with regard to one another, so as a conclusion may be drawn from them. See ENTHYMEMS, INDUCTION, PROPOSITION, RATIOCINATION, SORITES, SYLLOGISM, &c.

* ARGUMENTATIVE. *adj.* [from *argument*.] 1. Consisting of argument; containing argument.—This omission, considering the bounds within which the *argumentative* part of my discourse was confined, I could not avoid. *Atterb. Pref. to his Sermons.* 2. Sometimes with *of*, but rarely.—Another thing, *argumentative of* providence is, that pappous plumage growing upon the tops of some seeds, whereby they are wafted with the wind, and disseminated far and wide. *Ray.* 3. Applied to persons, disputations; disposed to controversy.

ARGUMENTUM AD HOMINEM, is to press a man with consequences, drawn from his own principles and concessions.

ARGUMENTUM AD JUDICIUM, an argument addressed to the judgment, drawn from any foundation of knowledge or probability. Mr Locke reckons this the best species of argument.

ARGUMENTUM A TUTO, an argument drawn from the consideration, that it is *more safe* to choose the one side of a question than the other, where the evidence seems doubtful or nearly equal on both sides. This species of argument is said to have been first used by Arnobius, and has been since successfully adopted by Pascal, Tillotson, Gastrel, and other advocates for Christianity, against Deists and Atheists; who, while they endeavour to undermine our faith in the gospel, and our hopes arising from it, give us nothing safe or certain in its place.

ARGUMENTUM BACULINUM literally signifies a cudgelling or *knock-him-down* argument; and is applied in cases where compulsion is used instead of reasoning. Every species of persecution for opinions, whether religious, political, or philosophical, may be termed an *argumentum baculinum*.

(1.) ARGUN, a city of Asiatic Tartary, seated on the ARGUN. (See N° 2.) There are mines of silver and lead near it. Lon. 103. 56. E. Lat. 42. 30. N. or as others have it, Lon. 104 5. E. Lat. 51. 36. N.

(2.) ARGUN, a river of Asiatic Russia, which separates the empires of Russia and China, and falls into the Amur.

(1.) ARGUS, in fabulous history, was the son of Aristor, and had 100 eyes, 50 of which were always open. Juno made choice of him to guard Io, whom Jupiter transformed into a white heifer; but Jupiter pitying Io for being so closely confined, sent Mercury, who, with his flute, charmed Argus to sleep, sealed up his eyes with his caduceus, and then cut off his head; when Juno, to reward his fidelity, turned him into a peacock, and placed his eyes in his tail.

(2.) ARGUS, in ornithology, a species of pheasant in Chinese Tartary.

(3.) ARGUS, in zoology, a kind of animal full of eyes, called in Iceland *oscubicornt* of which Wormius and Jacobus have given descriptions. It is of the testaceous kind, of an oblong form, resembling a crab's tail, and about two fingers breadth in length.

(4.) ARGUS, the son of Jupiter and Niobe, the founder and first king of Argos.

(5.) ARGUS, the son of Polybus and Argia, the carpenter and ship-master of the ARGO.

ARGUS-SHELL, in conchyliology, a species of porcelain shell, beautifully variegated with spots, resembling those in a peacock's tail.

ARGUTATION, a proving by argument; a disputing for and against. This is the definition given by Dr Johnson, in the former edition of his Dictionary, but he has omitted the article altogether in his last edition.

* ARGUTE. *adj.* [*arguto*, Ital. *argutus*, Lat.] 1. Subtle; witty; sharp. 2. Shrill.

ARGUTIÆ, witty and acute ſayings, which commonly ſignify ſomething further than what their mere words ſeem to import. Writers on rhetoric ſpeak of divers ſpecies of argutiæ, viz.

1. ARGUTIÆ AB ALIENO, when ſomething is ſaid, which ſeems repugnant either to the nature and property of a thing, or to common cuſtom, the laws, &c. which yet in reality is conſiſtent therewith; or when ſomething is given as a reaſon of another, which yet is not the reaſon of it.—For inſtance, *Si Caius nihil didiciſſet, erraſſet minus;* "If Caius had *learned nothing*, he had *erred leſs*:" or *Aureum hoc ſæculum eſt, quia plurimus jam auro honos venit;* "This is the *golden age*, for now much honour is acquired by *gold*."

2. ARGUTIÆ AB ALLUSIONE, thoſe wherein alluſions is made to ſome hiſtory, fable, ſentence, proverb, or the like: e. g. *Multi umbram captant et carnem amittunt;* "Many catch at the ſhadow and loſe the ſubſtance."

3 ARGUTIÆ A COMPARATIS, when two things are compared together, which yet at firſt ſight appear very different from each other, but ſo as to make a pretty kind of ſimile or diſſimile; e. g. *Hic eſt pauper nil cupiens principi omnia habenti;* "The poor man, who *deſires nothing*, is as happy as the prince who *has every thing*."

4. ARGUTIÆ A REPUGNANTIBUS, when two things meet in a ſubject, which yet regularly cannot be therein; or when two things are oppoſed to each other, yet the epithet of the one is attributed to the other; e. g. *Dum tacent clamant;* "While *ſilent*, they *proclaim*."

ARGYLE, or
(1.) ARGYLL, a county of Scotland, bounded on the S. by the Iriſh Sea and the Frith of Clyde; on the E. by the counties of Perth and Dumbarton; on the NE. by Lochaber; and on the NW. by ſeveral iſlands. It extends in length from S. to N. between the Mull of Kintyre and the point of Ardnamurchan, where it joins Inverneſs-ſhire; about 114 miles; and in breadth in ſome places, including the iſles, to 70. It was anciently called ARGATHELIA, and together with Perthſhire and the Weſtern Iſlands, conſtituted the ancient kingdom of the Scots, while the reſt of Caledonia was ſubject to the Picts and Romans. It comprehends Kintyre, Knapdale, Argyle Proper, Cowal, and Lorn.—This country, like moſt other parts of the Highlands, affords a very wild proſpect of hills, rocks, huge mountains, and tremendous precipices, piled upon each other, in a ſtupendous manner; bare, bleak, and barren to the view; or at beſt covered with ſhagged heath, which appears black and diſmal, except in ſummer, when it is variegated with an agreeable bloom of a purple colour. The coaſt of Argyll is rocky; yet indented with bays and inlets, that afford good harbours for ſhipping. The country is well watered by rivers, brooks, and lakes, abounding with fiſh; the vales and flat parts of it are cultivated for corn; the mountains feed an innumerable quantity of black cattle, which run wild among the hills in winter, as well as ſummer; the heath and woods, of which there is a conſiderable number, afford ſhelter to deer, roebucks, and all ſorts of game in great plenty: the circumambient ſea, with its locks, bays, and harbours, pours forth myriads of fiſh; but the innate wealth of the country is dug from the bowels of the mountains in iron, copper, lead, and other metals and minerals. Argyle is the ſeat of a provincial ſynod, conſiſting of five preſbyteries and 49 pariſhes.—Argyleſhire is generally peopled by the clan of Campbell; and affords a great number of caſtles and ſeats belonging to gentlemen who hold of the duke, and boaſt themſelves deſcended from his family. It ſends one member to parliament.

(2.) ARGYLL, DUKES OF. See CAMPBELL. The ancient and noble family of Campbell, the moſt powerful of the Scottiſh nobility, take their titles of duke and earl from this county. The duke of Argyle is, by hereditary right, great maſter of the king's houſehold in Scotland; admiral of the Weſtern Iſles; general of Denoon caſtle; keeper of Dunſtafinage and Carrick, and, before the juriſdictions were aboliſhed, enjoyed other hereditary offices, which rendered him too powerful as the ſubject of a limited monarchy.—He ſtill poſſeſſes many royalties; his vaſſals, even of the name of Campbell, are ſo numerous, and his influence extends ſo far, that he could, on occaſion, bring 3000 or 4000 fighting men into the field.

(3.) ARGYLL, IMPROVEMENTS OF. Mr Robſon, in his General View of this county, drawn up for the Board of Agriculture, among other intereſting particulars, mentions that the ſheep in the weſtern part of it are very much improved ſince firſt introduced;—that an extenſive lead mine at Stronſtian, carried on by an Engliſh company, gives employment to about 200 men, and will ſoon employ 100 more, the ores turning out beyond expectation;—that in ſome parts here are inexhauſtible quantities of rock and ſhell marle, which, now that the coal duty is taken off, will afford immenſe reſources of employment to many, who have hitherto had no means of bettering their ſituation, or even of ſupporting it; that in thoſe parts where the grazing ſyſtem prevails, it is common for ſubſtantial tenents to pay from 20 to 40 guineas for a Highland bull, and from 10 to 15 for the beſt cows; that the great roads in general are good, and agriculture is in a ſtate of great improvement in many places of the county." And Mr Knox obſerved, that when the projected canal ſhall be completed, and ſome villages and harbours erected, the populous county of Argyll will become one of the moſt valuable provinces in the Britiſh empire. It abounds in black cattle, ſheep, and fiſh, though the latter are leſs numerous than thoſe on the northern ſhores. Waſhed on both ſides by the ſea, deeply indented by navigable lakes and bays; having an eaſy communication with the fiſhing grounds, on the North Highlands; with Glaſgow, and the trading towns on the Clyde; with Ireland, Wales, Whitehaven, Liverpool, Briſtol, and other marts on the weſt coaſt of England, we may eaſily conceive that the period is at no great diſtance, when Argyleſhire will become a great commercial county. To corroborate this opinion, he obſerves, that after a veſſel gets under ſail from this coaſt, ſhe enters at once into the Atlantic, where ſhe meets with no interruption till ſhe makes the coaſt of America or the Weſt Indies. The line, therefore, which nature points out for the inhabi-

inhabitants, is, that of ſalt-making, fiſhing, ſhip-building, freights or the carrying trade; ſoap and glaſs making, by means of the kelp upon their ſhores, and ſand found upon Gia iſland, which is adapted for the latter.

(4.) ARGYLL PROPER is that diſtrict of Argyleſhire, which is bounded by Knapdale and Cowal on the S.; Lochaber on the N.; Lenox and the Grampian hills on the E.; and Lorne on the W. It lies between Lochfyn and Lochow; which abound with excellent trout and ſalmon.

ARGYRASPIDES, or ARGYROASPIDES, [from ἀργυρος ſilver, and ἀσπις, a ſhield,] in antiquity, ſoldiers armed with ſilver bucklers, or bucklers ſilvered. This corps, according to Quintus Curtius, were the ſecond of Alexander's army; the phalanx being the firſt. Juſtin ſays, that Alexander having penetrated into India, and extended his empire as far as the ocean; for a monument of his glory, ordered the armour of his ſoldiers, and the houſings of his horſes, to be adorned with ſilver. From this author it would ſeem, that Alexander's whole army were called argyraſpides. After that prince's death, the argyraſpides deſpiſed all other chiefs of the army, diſdaining to obey any other, having born arms under Alexander.

ARGYRIPÆ, or ARGYRIPPA. } See ARGOS HIPPIUM, N. 2.

ARGYRITÆ AGONES, in antiquity, games in which money was the prize.

ARGYRITIS, in natural hiſtory, a name given by the ancients to a ſubſtance reſembling ſilver. In this ſenſe, argyritis was uſed to ſignify ſuch litharge as was of a white colour, to diſtinguiſh it from that which was yellow, which they dignified with the name of chryſitis, as we do at preſent with that of litharge gold. The argyritis of modern writers, ſeems to have been the ſame with the *lapis magnetis* of the ancients, mentioned by Theophraſtus, and diſtinguiſhed from the magnet.

ARGYRODAMAS, in natural hiſtory, a ſort of ſilver coloured talc, which bears the fire, and neither burns, melts, nor changes its hue.

ARGYROGONIA is uſed by alchmiſts for a kind of argentific, or ſilver-making ſeed, pretended to be procurable from a ſolution of that metal perfectly concocted!

ARGYROLIBANUS, in the materia medica of the ancient Greeks, a word uſed to expreſs the white kind of olibanum

ARGYROPEA, or ARGYROPOEIA, } [from ἀργυρος, ſilver, and ποιεω, to make, in alchemy, the art of making ſilver out of imperfect metals.

ARGYRUNTUM, a maritime town of Illyria; now called Novigrad, in Dalmatia. Lon. 17 30. E. Lat. 44. 30.

ARGYTHAMNIA, in botany, a genus of the claſs and order monœcia tetandria: the eſſential character is, male calyx four leaved: corolla four petalled: female calyx five leaved, corolla none, ſtyles dichotomous, capſule nicocceous, ſolitary ſeeds. There is one ſhrubby ſpecies, a native of Jamaica.

(1.) ARHUSEN, or AARHUSEN. See AARHUUS. N° 1. To the account there given, we may add, that ſome geographers ſtate its extent at 60 miles in length, and 30 in breadth.

(2.) ARHUSEN, or AARHUSEN. See ARRHUUS. N° 1. Lon. 10. 0. E. Lat. 56. 6. N.

(1.) ARIA, [Ἀρια, Gr. martial,. one of the ancient names of Thrace, from the character of the people, whoſe country Euripedes calls the reſidence of Mars. It was the birth place of Sophocles

(2.) ARIA and ARIANA, in ancient geography, the names of either one, or two different countries, reſpecting which geographers are not agreed. Ptolemy mentions only Aria, and ſays nothing of Ariana. Pliny mentions Ariana, and ſays nothing about Aria; but diſtinguiſhes between Arii and Ariani: Parthia, he ſays, has the Arii to the E. Carmania and the Ariani to the S. from which it is conjectured, the Ariani extended farther than the Arii, and compriſed the Gedroſii and the Drangae. Arrian has only Aria and Arii, and is ſilent about Ariana. But Strabo gives more extenſive bounds to Ariana than to Aria, without particularly defining them: only in general he ſays, that Ariana begins from India, and quotes Eratoſthenes; according to whom, Ariana is bounded by the Indus on the E; on the S. by the Great Sea; by Paropamiſus and the mountains, quite to Portæ Caſpia, on the N. and on the W. by the ſame boundaries by which Parthia is ſeparated from Media, Carmania, Parætacene, and Perſia: and thus Ariana is extremely extenſive.—Aria has its limits thus deſcribed by Ptolemy: On the N. ſome parts of the Margiana and Bactriana; on the E. the Paropamiſidæ; and on the S. the Drangiana. Strabo ſays, the Arii adjoin to the Paropamiſidæ on the W.

(3.) ARIA, or ARIAPOLIS, now called HERAT, in Choraſan, an ancient town ſituated on the river Arias, which probably gave name to the country Ario.

(4.) * ARIA. *n. ſ.* [Ital. in muſick.] An air, ſong, or tune.

ARIADNÆA, in German antiquity, two feſtivals at Naxos, in honour of two women named *Ariadne*. In the ſolemnity dedicated to one of them, (See ARIADNE,) they had a ſhew of ſorrow and mourning; and, in memory of her being left by Theſeus near the time of child birth, it was uſual for a young man to lie down and counterfeit all the agonies of a woman in labour. This feſtival is ſaid to have been firſt inſtituted by Theſeus, to atone for his ingratitude to that princeſs! The other Ariadne was thought to be of a gay and ſprightly temper; and therefore her feſtival was obſerved with muſic and other expreſſions of mirth and joy.

ARIADNE, daughter of Minos king of Crete. Theſeus being ſent to deſtroy the Minotaur, Ariadne was ſo taken with him, that, as a teſtimony of her love, ſhe gave Theſeus a clue of thread to guide him out of the labyrinth. Theſeus, having killed the Minotaur, carried off the Athenians he had relieved, together with Ariadne; whom, however, he afterwards forſook. See ARIADNÆA.

ARIADNIA, in antiquity See ARIADNÆA.

ARIAN, in fabulous hiſtory, the horſe of Adraſtus, which ſaved his life. See ARION, No. 1.

ARIANA, in ancient geography, an extenſive country, compriſing Paropamiſus, Arachoſia, Drangiana, and Gedroſia, if we ſuppoſe it to reach to the ſea. See ARIA, N° 2.

ARIANI, the inhabitants of Aria, or Ariana. See ARIA, N° 2.

ARIANISM, the doctrine of Arius, who lived in the beginning of the fourth century. See ARIANS, ARIUS, and UNITARIAN.

ARIANNA, a ſmall village, 6 miles NE. from Tunis, remarkable for a beautiful range of the ancient Carthaginian aqueduct, 74 feet high, ſupported by columns 16 feet ſquare, and which ſtill increaſed in grandeur the nearer it approached Carthage. The ſtone was all diamond cut. Near this ſpot ſeveral ancient mattamores, or ſubterraneous magazines for corn, have been diſcovered within theſe few years, capable of containing 100 buſhels, ſtrongly arched with large ſquare ſtones. The Moors have already begun to demoliſh them, it being their cuſtom to do ſo with every monument of art, as ſoon as they diſcover it.

(1.) ARIANO, a town of Italy, in the Pope's territories, ſeated on a branch of the Po, 22 miles NE. of Ferrara. Lon. 12. 8. E. Lat. 45. 0. N.

(2.) ARIANO, a town of Italy, in the ulterior principality of Naples, under the archbiſhop of Benevento, 25 miles NE. of that town, and 19 NW. of Trevico. Mr Swinburne deſcribes it as an ugly city, built upon the uneven ſummit of a mountain, with an extenſive view on all ſides, but expoſed to every blaſt that blows. It does not appear to be ſo old as the time of the Romans, and therefore may be ſuppoſed to owe its riſe to the demolition of ſome neighbouring town, and to the advantages its ſituation afforded for diſcovery and defence. It is, however, a poor place, without trade or manufactures; having declined ever ſince the deſolation cauſed by an earthquake in 1456. It contains about 14,000 inhabitants, and no leſs than 20 pariſhes and convents, beſides an ill endowed cathedral. Its wine is a pale red like Champagne, which it alſo reſembles in a certain tartneſs, exceedingly refreſhing in hot weather. The ſoil lies upon a ſoft argilaceous ſtone At a ſmall diſtance to the eaſt is a bank conſiſting of layers of volcanic earths, interſperſed with thick ſtrata of oyſter-ſhells. Below the town is a convent of Dominicans, whoſe houſe, within theſe laſt 100 years, has been thrice overthrown by earthquakes. The laſt and moſt deſtructive happened in 1732, and was fatal to all the country along the eaſtern verge of the Apennines. To ſecure a retreat in caſe of future accidents, which from their ſituation they have every reaſon to expect, theſe fathers have conſtructed a ſmall building of wood, the parts of which being joined together with ſtrong iron chains, are contrived ſo, as by yielding to the oſcillatory motion of the earth eaſily return to their equilibrium. Lon. 15. 19. E. Lat. 41. 8. N.

(1.) ARIANS, followers of Arius, a preſbyter of the church of Alexandria about A. D 513; who maintained, that the Son of God was totally and eſſentially diſtinct from the Father; that he was the firſt and nobleſt of thoſe beings whom God had created, the inſtrument by whoſe ſubordinate operation he formed the univerſe; and therefore inferior to the Father both in nature and dignity: alſo that the Holy Ghoſt was not God, but created by the power of the Son. The Arians owned that the Son was the Word, but denied that Word to have been eternal. They held, that Chriſt had nothing of man in him but the fleſh, to which the λογος or Word was joined, which was the ſame as the ſoul in us.

(1.) ARIANS, HISTORY OF THE. The Arians were firſt condemned and anathematized by a council at Alexandria in 320, under Alexander, biſhop of that city; who accuſed Arius of impiety, and cauſed him to be expelled from the communion of the church: and afterwards by 318 others in the general council of Nice, aſſembled by Conſtantine in 325. The doctrine, however, was not extinguiſhed; on the contrary, it became the reigning religion, eſpecially in the Eaſt, where it obtained much more than in the Weſt. Arius was recalled from baniſhment by Conſtantine a two or three years after the council of Nice, and the laws that had been enacted againſt him were repealed. In 335, Athanaſius, his zealous opponent, was depoſed and baniſhed into Gaul, and Arius and his followers were reinſtated in the privileges, and received into the communion of the church. In little more than a year after this he fell a victim to the reſentment of his enemies, and died a tragical death, probably occaſioned by poiſon. See ARIUS. The Arian party found a protector in Conſtantius, who ſucceeded his father in the Eaſt; and the zeal with which he abetted them produced many animoſities and tumults to the time of his death in 362. They underwent various revolutions, perſecutions and oppreſſions, under ſucceeding emperors, according to the degree of intereſt they had in the civil power, till at length Theodoſius the Great exerted every poſſible effort to ſuppreſs and diſperſe them. The doctrine was carried in the fifth century into Africa under the Vandals; and into Aſia under the Goths. Italy, Gaul, and Spain, were alſo deeply infected with it; and towards the commencement of the ſixth century, it was triumphant in many parts of Aſia, Africa, and Europe. But it fell almoſt all at once, when the Vandals were driven out of Africa, and the Goths out of Italy, by the arms of Juſtinian. However, it revived again in Italy under the protection of the Lombards in the 7th century. Eraſmus ſeems to have aimed at ſome meaſure to reſtore Arianiſm, at the beginning of the 16th century, in his Commentaries on the New Teſtament. Accordingly, he was reproached by his adverſaries with Arian interpretations of gloſſes, Arian tenets, &c. To which he made no anſwer, ſave that there was no hereſy more thoroughly extinct than that of the Arians: *Nullam magis extinctam quam Arianorum.* But the face of things was ſoon changed. Servetus, a Spaniard by nation, publiſhed, in 1531, a little treatiſe againſt the Trinity, which once more revived the opinion of the Arians in the Weſt. Indeed he rather ſhowed himſelf a Photinian than an Arian; only that he made uſe of the ſame paſſages of Scripture, and the ſame arguments againſt the Saviour, with the proper Arians. Servetus had not, properly ſpeaking, any diſciples; but he gave occaſion, after his death to the forming of a new ſyſtem of Arianiſm in Geneva, much more ſubtle and artful than his own, and which not a little perplexed

perplexed Calvin. From Geneva the new Arians removed to Poland, where they gained conſiderable ground; but at length became Socinians. The appellation *Arian* has been indiſcriminately applied, in more modern times, to all thoſe who conſider Jeſus Chriſt as inferior and ſubordinate to the Father; and whoſe ſentiments cannot be ſuppoſed to coincide exactly with thoſe of the ancient Arians. Mr Whiſton was one of the firſt divines who revived the controverſy, in the beginning of the 18th century. He was followed by Dr Clarke, who publiſhed his famous book intitled *The Scripture Doctrine of the Trinity*, &c. In conſequence of which, he was reproached with the title of *Semi-Arian*. He was alſo threatened by the convocation and combated by argument. Dr Waterland, who has been charged with verging towards Tritheiſm, was one of his principal adverſaries. The hiſtory of this controverſy during the preſent century may be found in a pamphlet, intitled "An account of all the conſiderable Books and Pamphlets that have been wrote on either ſide, in the Controverſy concerning the Trinity, from the Year 1712; to the end of 1719." Mr James Purves, lately deceaſed, was the laſt perſon, who publicly avowed this doctrine in Edinburgh, both by preaching weekly to a ſmall congregation, and by publiſhing divers tracts on the ſubject. In England, too, the late Dr Price, was a moſt eminent advocate for the Arian ſyſtem. See PRICE.

(3.) ARIANS, SECTS OF THE. The Arians were divided into various ſects, of which ancient writers give an account under the name of *Semi-Arians*, *Euſebians*, *Aetians*, *Eunomians*, *Accacians*, *Pſathyrians*, and others. But they have been commonly diſtributed into three claſſes, viz. the *Genuine Arians*, *Semi-Arians*, and *Eunomians*.

ARIAPOLIS. See ARIA, N° 3.

ARIARATHES, the name of ſeveral ancient kings of Cappadocia. The laſt of them, being overcome by Perdiccas, ſet fire to his palace, and burnt himſelf, his family, and effects in it, rather than ſubmit to be carried captive.

ARIAS, ARIUS, or AREIOS, a river, on which Aria was ſeated, and which runs paſt Alexandria. It is now called HERI.

ARIAS MONTANUS, a learned Spaniſh divine, employed by Philip II. of Spain to publiſh another edition of the Bible, after that of cardinal Ximenes; which he finiſhed with applauſe, and died at Seville in 1598.

ARICA, a ſea port of ſouth America, in the province of Los Charaes, in Peru. It was formerly a conſiderable place: but was almoſt entirely deſtroyed by an earthquake in 1605; ſo that now there are only about 150 families, moſt of them blacks, mulattoes, and Indians. The houſes are made with canes or reeds, ſet upright, and bound together with cords or thongs; and as it never rains here, they are covered only with mats, which makes the place look at a diſtance like an heap of ruins. The vale of Arica is about a league wide, and ſix leagues long, next the ſea, and is all a barren country, except the ſpot where the old town ſtood, which is divided into little meadows of clover graſs, and plots of ſugar canes, with a few olive and cotton trees intermixt. The vale grows narrower as it runs eaſtward: and a league up there is a village, where they begin to cultivate pimento or Jamaica pepper, which is planted throughout all the reſt of the vale; and there are ſeveral farms, which produce nothing elſe, that bring in the value of, 80,000 crowns yearly. The Spaniards of Peru are ſo uſed to this pepper, that they dreſs no proviſions without it. Lon. 70. 15. W. Lat. 18. 26. S.

ARICIA, a princeſs of the blood royal of Athens, the wife of Hippolytus, who was reſtored to life by Æſculapius, and is ſaid to have erected a temple to Diana in the foreſt of Aricine, where he was concealed after his reſurrection, and to have eſtabliſhed a prieſt and feſtivals.

ARICINA, in the mythology, an epithet of Diana, under which ſhe was worſhipped in the foreſt of ARICINE. See laſt article.

ARICINE, a foreſt of Athens, ſo named from the princeſs ARICIA.

ARICONIUM, a town of the Silures, a nation of the ancient Britons, now called HEREFORD. Lon. 2. 42. W. Lat. 52. 4. N.

(1.) * ARID. *adj.* [*aridus*, Lat. dry.] Dry; parched up.—My complexion is become a duſt, and my body *arid*, by viſiting lands. *Arbuthnot and Pope.*

(2.) ARID, plowed. *Chaucer.*

ARIDAS, a kind of taffety, manufactured in the Eaſt Indies from a ſhining thread which is got from certain herbs, whence they are ſtyled *aridas of herbs*.

To ARIDATE, *v. a.* to make dry. *Bailey.*

ARIDED, or } in aſtronomy, a fixed, ſtar of
ARIDEF, } the ſecond magnitude, in the extremity of the ſwan's tail. It is alſo called HIEREZIM and ADIGEGE.

ARIDELOSIS, [ἀφανλωσις,] in rhetoric, is ſometimes uſed for the figure commonly called *ſynonymia*.

* ARIDITY. *n. ſ.* [from *arid.*] 1. Dryneſs; ſiccity.—Salt taken in great quantities will reduce an animal body to the great extremity of *aridity*, or dryneſs. *Arbuthnot.* 2. In the theological ſenſe, a kind of inſenſibility in devotion, contrary to unction or tenderneſs.—Strike my ſoul with lively apprehenſions of thy excellencies, to bear up my ſpirit under the greateſt *aridities* and dejections, with the delightful proſpect of thy glories. *Norris.*

ARIDULLAM, in natural hiſtory, a kind of zarnich found in the Eaſt Indies. See ZARNICH.

ARIDURA, in phyſic, a dryneſs or want of moiſture. The word is alſo uſed by ſome for an ARIDITY, or conſumption; by others for a hectic fever; and more frequently by modern writers, for a waſting of ſome ſingle member of the body, in which ſenſe, it amounts to the ſame with what is called a *withering*.

ARIEGE, a river of France, which riſes in the Pyrenean mountains, and running by Foix, and Pamiers, falls into the Garonne. Gold duſt is found amongſt its ſands.

ARIEL, a name of Jeruſalem, ſo called from its warlike force.

ARIERE-BAN, a term uſed for the proclamation of war, by the ci-devant kings of France.

(1.) * ARIES. *n. ſ.* [Lat.] The Ram; one of the twelve ſigns of the zodiack; the vernal ſign.—

At laſt from *Aries* rolls the bounteous ſun,
And the bright Bull receives him. *Thomſon.*

(2.) ARIES,

(2.) ARIES, in zoology. See OVIS.

(3.) ARIES, the battering ram. See BATTERING RAM.

* *To* ARIETATE. *v. a.* [*arieto*, Lat.] 1. To butt like a ram. 2. To ſtrike in imitation of the blows which rams give with their heads.

(1.) * ARIETATION. *n. ſ.* [*arietatio*.] 1. The act of butting like a ram. 2. The act of battering with an engine called a ram.—The ſtrength of the percuſſion, wherein ordnance do exceed all *arietations* and ancient inventions. *Bacon.* 3. The act of ſtriking, or conflicting in general.—Now thoſe of heterogeneous atoms, by themſelves, hit ſo exactly into their proper reſidence, in the midſt of ſuch tumultuary motions, and *arietations* and other particles. *Glanville.*

(2.) ARIETATION. See EARTHQUAKE.

* ARIETTA. *n. ſ.* [Ital. in muſick.] A ſhort air, ſong, or tune.

ARIETUM LAVATIO, an ancient kind of ſportive exerciſe, probably the ſame with what of later times is called *running at the quintain.*

* ARIGHT. *adv.* [from *a* and *right*.] 1. Rightly; without mental errour.—The motions of the tongue are ſo eaſy, and ſo ſubtle, that you can hardly conceive or diſtinguiſh them *aright. Holder.* 2. Rightly; without crime.—A generation that ſet not their heart *aright. Pſalms.* 3. Rightly; without failing of the end deſigned.—

Guardian of groves, and goddeſs of the night,
Fair queen, he ſaid, direct my dart *aright. Dryd.*

ARII. See ARIA, N° 2.

ARILLUS, an improper term invented by Linnæus, and defined to be the proper exterior coat or covering of the ſeed, which falls off ſpontaneouſly. All ſeeds are not furniſhed with an arillus; in many, a dry covering, or ſcarf-ſkin, ſupplies its place. In Jeſſamy; hound's tongue, *cynoglaſſum*; cucumber; fraxinella, *dictamnus*; ſtaff-tree, *celaſtrus*; ſpindle-tree *euonymus*; African ſpiræa *dioſma*; and the coffee-tree *coffea*; it is very conſpicuous. In the genus hound's tongue, four of theſe arilli, or proper coats, each infolding a ſingle ſeed, are affixed to the ſtylus; and in this circumſtance, ſays Linnæus, does the eſſence of the genus conſiſt. In fraxinella, the arillus is common to two ſeeds. The ſtaff-tree has its ſeeds only half involved with this cover. The arillus is either *baccatus*, ſucculent, and of the nature of a berry; as in the ſpindle-tree *euonymus*. *Cartilagineus*, cartilaginous, or griſtly; as in the African ſpiræa, *dioſma*. *Coloratus*, coloured; as in the ſtaff-tree. *Elaſticus*, endued with elaſticity, for diſperſing the ſeeds; as is remarkable in the African ſpiræa, *dioſma*, and fraxinella. *Scaber*, rough and knotty; as in hound's tongue. Although covered with an arillus or other dry coat, ſeeds are ſaid to be naked *(ſemina nuda)* when they are not incloſed in any ſpecies of pericarpium or fruit veſſel: as in the graſſes, and the *labiati* or lipped flowers of Tournefort, which correſpond to the *didynamia gymnoſpermia* of Linnæus. Seeds are ſaid to be covered *(ſemina tecta)* when they are contained in a fruit veſſel, whether capſule pod, or pulpy pericarpium, of the apple, berry, or cher- SEMEN.) This exterior coat of th former writers, ſtyled *calyptra*. S he different ſkins or coverings of the ſeed, are adapted, ſay naturaliſts, for moving the nutritive juices, and tranſmitting them within.

ARIMANIUS, the evil god of the ancient Perſians. The Perſian Magi held two principles; a good dæmon, or god, and an evil one: the firſt the author of all good, and the other of all evil: the former they ſuppoſed to be repreſented by light, and the latter by darkneſs, as their true ſymbols. The good principle they named *Yazdan* or *Yezdan*, and *Ormozd* or *Hormizda*, which the Greeks wrote *Oromaſdes*; and the evil daemon they called *Abrimon*, and the Greeks *Arimanius*. Some of the Magians held both theſe principles to have been from all eternity; but this ſect was reputed heterodox: the original doctrine being, that the good principle only was eternal, and the other created.—Plutarch gives the following account of the Magian traditions in relation to the gods and the introduction of evil into the world, viz. That Oromazes conſiſted of moſt pure light, and Arimanius of darkneſs; and that they were at war with each other: that Oromazes created ſix gods; 1. the author of Benevolence; 2. of Juſtice; 3. of Truth; 4. of Contentment; 5. of Perſuaſure; and 6. of Riches; and that Arimanius made as many, who were the authors of the oppoſite evils or vices: that then Oromazes, tripling himſelf, removed as far from the ſun as the ſun is from the earth, and adorned the heaven with ſtars, appointing the dog-ſtar for their guard and leader: that he alſo created 24 other gods, and incloſed them in an egg; but Arimanius having alſo made an equal number, theſe laſt perforated the egg, by which means evil and good became mixed together. However, the fatal time will come, when Arimanius, the introducer of plagues and famine, muſt be of neceſſity utterly deſtroyed by the former, and annihilated; then the earth being made plain and even, mankind ſhall live in a happy ſtate, in the ſame manner, in the ſame political ſociety, and uſing one and the ſame language. Theopompus writes, that according to the Magians, the ſaid two gods, during the ſpace of 3000 years, alternately conquer, and are conquered; that for other 3000 years they will wage mutual war, fight, and deſtroy the works of each other, till at laſt Hades (or the evil ſpirit) ſhall periſh, and men become perfectly happy, their bodies needing no food, nor caſting any ſhadow, i. e. being perfectly tranſparent.

ARIMASPI, a people of Sarmatia Europea, on the Montes Riphæi, ſaid by Mela to have but one eye; a fable broached by Ariſteas Proconneſius, according to Herodotus.

ARIMATHEA, a town of Judea, ſuppoſed to be the ſame with *Ramatha*, (1 Sam. i.) and ſituated in the tribe of Ephraim.—This place is now called *Ramla*; and is in a very ruinous ſtate, containing nothing but rubbiſh within its bounds. The Aga of Gaza reſides here in a Serai, the roof and walls of which are tumbling down. He maintains about 100 horſemen, and as many foot ſoldiers, who (ſays Mr Volney) are lodged in the old Chriſtian church, the nave of which is uſed as a ſtable, and in an ancient kan, which is ſwarming with them by the ſcorpions. The adjacent country is planted with lofty olive trees,

quincunxes. The greateſt part of them are as large as the walnut trees of France; but they are daily periſhing through age, the ravages of contending factions, and even from ſecret miſchief; for, in theſe countries when a peaſant would revenge himſelf of his enemy, he comes by night, and ſaws or cuts his trees cloſe to the ground, and the wound, which he takes care to cover, draining off the ſap like an iſſue, the olive tree languiſhes and dies Among theſe plantations, we meet, at every ſtep, with dry wells, ciſterns fallen in, and vaſt vaulted reſervoirs, which prove that, in ancient times, this town muſt have been upwards of a league and a half in circumference. At preſent it ſcarcely contains 200 families. The little land, which is cultivated by a few of them, belongs to the Mufti, and two or three perſons related to him. The reſt content themſelves with ſpinning cotton, which is chiefly purchaſed by two French houſes eſtabliſhed there. The only remarkable antiquity at Ramla is the minoret of a ruined moſque on the road to Yafa, which is very lofty; and by an Arabic inſcription appears to have been built by the ſultan Saladin.

ARMINUM, a town of Umbria, or Romagna, at the mouth of the Areminus, on the Gulph of Venice. The ſeizing on it by Cæſar gave riſe to the civil war. It is now called *Rimini*. Lon. 13. 58. E. Lat. 44 10. N.

ARMINUS, a river that runs into the Gulph of Venice.

ARINGA, in ichthyology, a name given by Paulus Jovius and others to the herring.

ARIOBARZANES I. king of Cappadocia, was choſen by the people of that country, A. A. C. 91; but in a ſhort time after Tigranes, king of Armenia, expelled him. He, however, having gone to Rome, obtained ſuch aſſiſtance as enabled him to recover the crown, which he afterwards reſigned in favour of his ſon.

ARIOBARZANES II being very much attached to Cæſar, was declared an enemy by the republic, and put to death by Caſſius, A. A. C. 42.

ARIOBARZANES III. brother and ſucceſſor of the laſt mentioned, was dethroned and put to death by Marc-Antony.

ARIOCH, king of Ellaſar, an ally of Chedorlaomer, was one of the nine monarchs who engaged in the firſt battle of which we have any authentic account. See Gen. xiv.

* ARIOLATION, or HARIOLATION. *n. ſ.* [*hariolus*, Lat. a foothſayer.] Soothſaying; vaticination.—The prieſts of elder time deluded their apprehenſions with *ariolation*, ſoothſaying, and ſuch oblique idolatries. *Brown.*

ARIOLI, in antiquity, a kind of prophets, or religious conjurers, who, according to Origen and Iſidore, by abominable prayers, and horrible ſacrifices at the altars of idols, procured anſwers to their queſtions concerning future events. Theſe are alſo called *harioli*, and their operation *hariolation*. Sometimes they were denominated *aruſpices*, or *haruſpices*. The arioli were diſtinguiſhed by a ſlovenly dreſs, diſorderly and matted beards, hair, &c.

(1.) ARION, in fabulous hiſtory, an excellent muſician and poet, inventor of dithyrambics. Periander entertained him at his court, where, getting an eſtate, and returning to Corinth, the ſailors, for the ſake of his money, threw him into the ſea; when, according to the poets, a dolphin, charmed with his muſic, took him on her back, and carried him ſafe aſhore.

(2.) ARION, in the mythology, an admirable horſe, much more famous in poetic hiſtory than Bucephalus in that of Alexander. Authors ſpeak variouſly of his origin, though they agree in giving him a divine one. His production is moſt commonly aſcribed to Neptune. This god, according to ſome, raiſed him out of the ground by a ſtroke of his trident: according to others, he begot him upon the fury Erynnys; according to others upon Ceres, whom he raviſhed in the form of a horſe, ſhe having previouſly aſſumed the form of a mare to elude his purſuit. This horſe was nurſed by the Nereids; and being ſometimes yoked with the ſea horſes of Neptune to the chariot of this god, he drew him with incredible ſwiftneſs through the ſea. He had this ſingularity in him, that his right feet reſembled thoſe of a man. Neptune gave him to Capreus king of Haliartus. Capreus made a preſent of him to Hercules; who mounted him when he took the city of Elis, gained the prize with him in the race againſt Cygnus the ſon of Mars near Træcena, and at laſt made a preſent of him to Adraſtus. It was under this laſt maſter that Arion ſignalized himſelf moſt: he won the prize for racing at the Nemean games, which the princes who went to beſiege Thebes inſtituted in honour of Archemorus; and was the cauſe that Adraſtus did not periſh in this famous expedition, as all the other chiefs did.

ARIOSE. See next article.

* ARIOSO. *n. ſ.* [Ital. in muſick] The movement of a common air, ſong, or tune. *Diſt.*

ARIOSTI, Attilio, a celebrated muſician, born at Bologna. He entered among the order of Dominicans; but afterwards, by virtue of a diſpenſation from the pope, gave up his connection with them. He was for ſome time an opera compoſer at Bologna and Venice; after which he travelled into Germany and England. His performance on a new inſtrument, called the *Viol d' Amore*, attracted particular notice. He was much eſteemed in England, where he publiſhed a book of cantatas, by ſubſcription, about 1725. The time of his death is not certain.

ARIOSTO, Lodovico, the famous Italian poet, author of Orlando Furioſo, was born at the caſtle of Reggio in Lombardy, in 1474. His father, who was major-domo to duke Hercules, lived to the extent of his fortune, and ſo left but little at his death Arioſto, from his childhood ſhewed great marks of genius, eſpecially in poetry; and wrote a tragedy in verſe on the ſtory of Pyramus and Thiſbe, which his brothers and ſiſters played. His father being utterly unlearned, and rather regarding profit than his ſon's inclination, compelled him to ſtudy the civil law, in which having plodded ſome years to no purpoſe, he quitted it for more pleaſing ſtudies; yet often lamented, as Ovid and Plutarch did before him, and our own Milton ſince, that his father baniſhed him from the

the Muſes. At the age of 24, Arioſto loſt his father, and found himſelf perplexed with family affairs. However, in about ſix years he was, for his good parts, taken into the ſervice of Don Hippolito, cardinal of Eſte. At this time he had written nothing but a few ſonnets; but he now reſolved to make a poem, and choſe Bayardo's *Orlando Inamorato* for a ground work. However, he was prevented writing for a great many years, and was choſen as a fit perſon to go on an embaſſy to Pope Julia II. where he gave ſuch ſatisfaction, that he was ſent again, underwent many dangers and difficulties, and at his return was highly favoured. Then, at his leiſure, he again applied himſelf to his poem: but, ſoon after, he incurred the cardinal's diſpleaſure for refuſing to accompany him into Hungary; by which he was ſo diſcouraged, that he deferred writing for 14 years, even till the cardinal's death. After that, he finiſhed by degrees, in great perfection, that which he began with great expectation. Duke Aſtolfo offered him great promotions if he would ſerve him: but, preferring liberty to grandeur, he refuſed this and other great offers from princes and cardinals, particularly from Leo X. from all whom, however, he received great preſents. The duke of Ferrara delighted ſo much in his comedies, of which he wrote five, that he built a ſtage on purpoſe to have them acted in his court, and enabled our poet to build himſelf a houſe in Ferrara, with a pleaſant garden, where he uſed to compoſe his poems, which were highly eſteemed by all the princes in Italy, who ſent him many preſents; but he ſaid, "he would not ſell his liberty for the beſt cardinal's hat in Rome." It was a ſmall, though convenient houſe: Being aſked, why he had not built it in a more magnificent manner, ſince he had given ſuch noble deſcriptions of ſumptuous palaces, beautiful porticos, and pleaſant fountains, in his Orlando Furioſo? he replied, That words were cheaper laid together than ſtones. In his diet he was ſo temperate, that he was fit to have lived in the world when men fed upon acorns. Whether he was ever married, is uncertain. He kept company with one Alexandria, to whom, it was reported, he was married privately, and a lady Genevera, whom he often mentions in the 24th book of his Orlando, as poets intermix with their fictions ſome real amours of their own. He was urged to go ambaſſador to Pope Clement, but would by no means accept this embaſſy. He tranſlated the *Menocmi* of Plautus: and all his own comedies were ſo much eſteemed, that they were frequently acted by perſons of the firſt quality. When his Lena was firſt repreſented, Ferdinand of Eſte, afterwards marquis of Malta, ſpoke the prologue. He began one of his comedies in his father's lifetime, when the following incident ſhews the remarkable talent he had for poetry. His father one day rebuked him ſharply, charging him with ſome great fault; but all the while he returned him no anſwer. Soon after his brother began the ſame ſubject; but he eaſily refuted him, and, with ſtrong arguments, juſtified his own behaviour. "Why then (ſaid his brother) did you not ſatisfy my father?" "In truth (ſaid Lodovico) I was thinking of a part in my comedy; and methought my father's ſpeech to me was ſo ſuited to the part of an old man's chiding his ſon, that I forgot I was concerned in it myſelf, and conſidered it only to make it a part of my play." Arioſto was tall, of a melancholy complexion, and ſo abſorbed in ſtudy and meditation, that he often forgot himſelf. His picture was drawn by Titian in a maſterly manner. He was honoured with the laurel by the hands of the emperor Charles V. He was naturally affable, always aſſuming leſs than his due, yet never putting up with a known injury even from his ſuperiors. He was ſo fearful on the water, that, whenever he went out of a ſhip, he would ſee others go before him; and, on land, he would alight from his horſe on the leaſt apprehenſion of danger. He was of an amorous diſpoſition, and left two natural ſons. He enjoyed the friendſhip of the moſt eminent men of learning of his time, moſt of whom he mentions with great reſpect in the laſt canto of his Orlando Furioſo. His conſtitution was but weakly, ſo that he was obliged to have recourſe to phyſicians the greateſt part of his life. He bore his laſt ſickneſs with great reſolution and ſerenity; and died at Ferrara the 8th of July 1533, according to Sir John Harrington, being then 59 years of age. He was interred in the church of the Benedictine monks, who, contrary to their cuſtom, attended his funeral. H. had a buſt erected to him, and an epitaph, written by himſelf, inſcribed upon his tomb.

ARIPO, a ſtrong town of Aſia, on the weſtern coaſt of the iſland of Ceylon, at the mouth of the Sarunda. It belongs to the Dutch; and to the eaſt of it is a pearl fiſhery. Lon. 80. 25. E. Lat. 8. 42. N.

ARISARIUM, or ARUM, in botany, wake-robin.

ARISBA, in ancient geography, 1. a town in the iſland of Leſbos: 2. Another in Troas, in the territory and to the SE. of Abydos; the rendezvous of Alexander's army after their paſſage of the Helleſpont: 3. a colony of the Mitylenians, taken and plundered by Achilles. It was the reſidence of Axylus, celebrated by Homer for his hoſpitality.

* *To* ARISE. *v. n.* pret. *aroſe*, particip. *ariſen*. [from *a* and *riſe*.] 1. To mount upward as the ſun.

He roſe, and, looking up, beheld the ſkies
With purple bluſhing, and the day *ariſe*. *Dryd.*

2. To get up from ſleep, or from reſt.—So Eſdras *aroſe* up, and ſaid unto them, ye have tranſgreſſed the law. 1. *Eſd.* ix 7.—How long wilt thou ſleep, O ſluggard; when wilt thou *ariſe* out of thy ſleep? *Prov.* vi. 9. 3. To come into view, as from obſcurity.—There ſhall *ariſe* falſe Chriſts and falſe prophets. *Matt.* xxiv. 4. To revive from death.—Thy dead men ſhall live, together with my body ſhall they *ariſe*: awake and ſing, ye that dwell in duſt. *Iſaiah* xxvi. 19. 5. To proceed or have its original.—They which were ſcattered abroad upon the perſecution that *aroſe* about Stephen travelled as far as Phœnice. *Acts* xi. 19.—I know not what miſchief may *ariſe* hereafter from the example of ſuch an innovation. *Dryden.* 6. To enter upon a new ſtation, to ſucceed to power or office.—

Another

Another Mary then *aroſe*,
And did rig'rous laws impoſe. *Cowley.*

7. To commence hoſtility.—And when he *aroſe againſt me*, I caught him by his beard, and ſmote him. 1 *Sam.* xvii. 35. For the various ſenſes of this word, ſee RISE.

ARISH, a Perſian long meaſure containing about 38 Engliſh inches.

ARISI, rice, an Indian word, which does not properly ſignify the plant which produces the rice, but the ſeed itſelf, when cleanſed from its huſk, and rendered fit for uſe. The Indians call it *ariſi* in this ſtate; but in the huſk, and upon the plant they call it *nellou*. See ORISA.

(1.) ARISTA, in aſtronomy, the *Spica Virginis*.

(2.) ARISTA, in botany, a long needle-like beard, that grows out from the huſk of bear or graſs; called alſo the *awn*.

(3.) ARISTA, in ichthyology. See ATHERINA.

ARISTÆUS, the ſon of Apollo and Cyrene, whom, for the many ſervices he had rendered to mankind by his knowledge of the uſeful arts, the gods placed amongſt the ſtars; where he is ſaid to be the Aquarius in the zodiac. The reſemblance of his hiſtory to that of Moſes has been curiouſly diſcuſſed by Huetius.

ARISTANDER, a famous ſoothſayer under Alexander the Great, over whom he gained a wonderful influence by the ſucceſs of his art. He had enjoyed the ſame office under Philip; and explained better than his brethren the dream that this prince had after he married Olympias.

(1.) ARISTARCHUS, a celebrated grammarian, much eſteemed by Ptolemy Philometor, who entruſted him with the education of his ſon. He applied himſelf chiefly to criticiſm, and made a reviſal of Homer's poems, but in too magiſterial a way; for ſuch verſe as he did not like he treated as ſpurious. He alſo criticiſed on other poets.

(2.) ARISTARCHUS, a Grecian philoſopher of Samos, one of the firſt that maintained that the earth turns upon its own centre. We are not ſure of the age in which he lived; and have none of his works, but a "Treatiſe of the greatneſs and diſtance of the Sun and Moon," tranſlated into Latin by Frederic Commandine, and publiſhed with Pappus's explanations in 1572.

(3.) ARISTARCHUS, in the original [Ἀριστάρχος,] ſignifies beſt prince; but in its ordinary uſe among the learned, denotes a ſevere critic; from the learned grammarian of that name, (See N° 1.) who criticiſed the verſes of Homer, &c. Hence we derive the titles of ſeveral books; as Ariſtarchus ſacer, the name of Heinſius's notes on the New Teſtament; Ariſtarchus Anti-Bentleianus, &c.

(4.) ARISTARCHUS of Theſſalonica, a primitive chriſtian, who attended Paul to Epheſus, where he was in danger of his life in the riot raiſed by Demetrius; and afterwards to Rome, where he was beheaded along with him.

ARISTEA, in botany, a genus of the triandria monogynia claſs and order. The eſſential character is, petals ſix, ſtyle declinate, ſtigma funnel ſhaped gaping, capſule inferior with numerous ſeeds. There is one ſpecies, a native of the Cape of Good Hope.

ARISTIDA, in botany: a genus of the triandria digynia claſs; and, in the natural method, ranking under the 4th order, *Gramina*. The calyx has a double valve; the corolla has one valve, and three awns at the points. There are 3 ſpecies of Ariſtida, viz.

1. ARISTIDA ASCENSIONIS, a native of the iſland of Aſcenſion;

2. ARISTIDA AMERICANA, a native of Jamaica; and

3. ARISTIDA PLUMOSA, a native of America.

(1.) ARISTIDES, a celebrated Athenian general, ſurnamed the JUST, flouriſhed at the ſame time with Themiſtocles, who triumphed over him by his boiſterous eloquence, and got him baniſhed, A. A. C. 483. (See OSTRACISM): but Ariſtides being recalled a ſhort time after, would never join with the enemies of Themiſtocles to get him baniſhed; for nothing could make him deviate from the ſtricteſt rules of moderation and juſtice. Ariſtides brought the Greeks to unite againſt the Perſians; diſtinguiſhed himſelf at the famous battles of Marathon, Salamine and Platea; and eſtabliſhed an annual income of 460 talents for a fund to bear the expences of war. This great man died ſo poor, though he had the management of the revenues of Greece, that the ſtate was obliged to pay his funeral expences, to give fortunes to his daughters in marriage, and a maintenance to his ſon Lyſimachus.

(2.) ARISTIDES, Ælius, a celebrated orator, born in Myſia, about A. A. C. 129. The beſt edition of his works is that of Oxford, printed in Greek and Latin, in two volumes 4to.

(3.) ARISTIDES, a painter, cotemporary with Apelles, flouriſhed at Thebes about the 122d Olympiad. He was the firſt, according to Pliny, who expreſſed character and paſſion, the human mind, and its ſeveral emotions; but he was not remarkable for ſoftneſs of colouring. "His moſt celebrated picture was of an infant (on the taking of a town) at the mother's breaſt, who is wounded and expiring. The ſenſations of the mother were clearly marked, and her fear leſt the child, upon failure of the milk, ſhould ſuck her blood. Alexander the Great took this picture with him to Pella." Junius, (in his Treatiſe *de Pictura Veterum*) conjectures that a beautiful Greek epigram of Æmilianus of which the following is a tranſlation, was written on this picture:—

Suck, little wretch, while yet thy mother lives,
Suck the laſt drop her fainting boſom gives!
She dies! her tenderneſs ſurvives her breath,
And her fond love is provident in death.

(4.) ARISTIDES, a very eloquent Athenian orator, who became a convert to the Chriſtian religion, and about the year 124 preſented to the emperor Adrian an apology for the Chriſtians.

(5.) ARISTIDES of Miletus, a famous Greek author, often cited by the ancients.

(I. 1.) ARISTIPPUS, a native of Cyrene in Libya, the founder of the Cyrenaic ſect of philoſophy, the ſon of Aretades, flouriſhed about the 96th Olympiad. The great reputation of Socrates induced him to remove to Athens, that he might hear his diſcourſes. He was chiefly delighted with thoſe that related to pleaſure; which he

he aſſerted to be the ultimate end in which all happineſs conſiſts. His manner of life was agreeable to his opinion; for he indulged himſelf extremely in all the luxuries of dreſs, wine, and women. Though he had a good eſtate, and three country ſeats, yet he was the only one of the diſciples of Socrates who took money for teaching; which being obſerved by the philoſopher, he aſked Ariſtippus. How he came to have ſo much? Who in reply aſked him, How he came to have ſo little? Upon his leaving Socrates, he went to Ægina, as Athenæus informs us, where he lived with more freedom and luxury than before. Socrates ſent frequent exhortations to him, in order to reclaim him; but all in vain: and with the ſame view he publiſhed that diſcourſe which we find in Xenophon. Here Ariſtippus became acquainted with Lais, the famous courtezan of Corinth; for whoſe ſake he took a voyage to that city. He continued at Ægina till the death of Socrates, as appears from Plato's Phædon, and the epiſtle which he wrote upon that occaſion. He returned at laſt to Cyrene, where he profeſſed philoſophy, and inſtituted a ſect which was called the *Cyrenaic*, from the place, and the *Hedonic* or the voluptuous, from its doctrines. During the height of the grandeur of Dionyſius the Sicilian tyrant, a great many philoſophers reſorted to him; and among the reſt Ariſtippus, who was tempted by the magnificence of that court. Dionyſius aſking him the reaſon of his coming, he replied, "That when he wanted *wiſdom*, he went to Socrates; but now as he wanted *money*, he was come to him." He ſoon inſinuated himſelf into the favour of Dionyſius; for, being a man of an eaſy temper, he conformed himſelf to every place, time, and perſon, and was a complete maſter of the moſt refined complaiſance. After he had lived a long time with Dionyſius, his daughter Arete ſent to him deſiring his preſence at Cyrene, to take care of her affairs, as ſhe was in danger of being oppreſſed by the magiſtrates. But he fell ſick in his return home, and died at Lipara, an Æolian iſland.

(2.) ARISTIPPUS, APOPHTHEGMS OF. Diogenes Laertius mentions ſeveral anecdotes of Ariſtippus, during his reſidence at the court of Sicily. Dionyſius, at a feaſt, commanded that all ſhould put on women's purple habits, and dance in them. Plato refuſed, alledging it would diſgrace his manhood; but Ariſtippus readily ſubmitted and replied, "At feaſts where mirth is free, a ſober mind can never be corrupted." At another time, interceding with Dionyſius in behalf of a friend but not prevailing, he caſt himſelf at his feet: being reproved by one for that exceſs of humility, he replied, "That it was not *he* who was the cauſe of that ſubmiſſion; but Dionyſius, whoſe ears were in his *feet*." Dionyſius ſhowed him 3 beautiful courtezans, and ordered him to take his choice. Upon which he took them all 3 away with him, alledging that Paris was puniſhed for preferring one to the other two: but when he had brought them to his door, he diſmiſſed them, to ſhow that he could either enjoy or reject with the ſame indifference. Having deſired money of Dionyſius, the latter obſerved to him, that he had aſſured him a wiſe man wanted nothing. "Give me, ſays he, what I aſk, and we will talk of that afterwards." When Dionyſius had given it him, "Now (ſays he), you ſee I do not want." By this complaiſance he gained ſo much upon Dionyſius, that he had a greater regard for him than for all the reſt of the philoſophers, though he ſometimes ſpoke with ſuch freedom to that king, that he incurred his diſpleaſure. When Dionyſius aſked, Why philoſophers haunted the gates of rich men, but not rich men thoſe of philoſophers? he replied, "Becauſe the latter know *what* they want, and the others do *not*." Another time Dionyſius repeating out of Sophocles, theſe verſes,

He that with tyrants ſeeks for bare ſupport,
Enſlaves himſelf, though free he came to court,

he immediately anſwered, "He is no ſlave, if he be *free to come*." Ariſtippus had a conteſt with Antiſthenes the Cynic philoſopher; notwithſtanding which, he employed his intereſt at court for ſome friends of Antiſthenes, to preſerve them from death, as we find by a letter of his to that philoſopher. Diogenes followed the example of his maſter Antiſthenes in ridiculing Ariſtippus, and called him the *court ſpaniel*. Suidas obſerves, that Ariſtippus ſurpaſſed all the philoſophers in the cuteneſs of his apophthegms. Being once raiſed and he left the room; and the perſon who abuſed him following him, and aſking him why he went away, he anſwered, "Becauſe it is in your power to rail, but it is not in my power not to hear you." When one recommended his ſon to him, he demanded 500 drachmas; and upon the father's replying that he could buy a ſlave for that ſum, "Do ſo (ſaid he), and then you'll be maſter of a couple." Being reproached, becauſe, having a ſuit of law depending, he feed a lawyer to plead for him: "Juſt ſo (ſaid he), when I have a great ſupper to make, I always hire a cook." Being aſked what was the difference between a wiſe man and a fool, he replied, "Send both of them together naked to thoſe who are acquainted with neither of them, and then you'll know." Being reproved by Plato for his coſtly feaſts, "I warrant you (ſaid he), that you would not have beſtowed three farthings upon ſuch a dinner;" which the other confeſſed. "Why, then," ſaid he, "I find that I love my belly, and you love your money." His ſervant carrying after him a great weight of money, and being ready to ſink upon the road under his burden, he bid him throw away all that was too much for him to carry. Horace mentions this fact, Lib. 2. Sect. 3. Being reproached for going from Socrates to Dionyſius, he replied, "That he went to Socrates for inſtruction, and to Dionyſius for diverſion." Having received money of Dionyſius at the ſame time that Plato accepted a book of him, and being reproached for it, "The reaſon is plain (ſaid he), I want money, and Plato wants books." Having loſt a conſiderable farm, he ſaid to one who ſeemed to compaſſionate his loſs, "You have but one field; I have 3 left: why ſhould not I rather grieve for you?" When a perſon told him, "That the land for *his* ſake was loſt," he replied, "That it was better ſo, than that *he* ſhould be loſt for the ſake of the land."

(3.) ARISTIPPUS, OPINIONS OF. Like Socrates, he rejected the ſciences as they were then taught, and pretended that logic alone was ſufficient to

teach truth and fix its bounds. He aſſerted, that pleaſure and pain were the criterions by which we were to be determined; that theſe alone made up all our paſſions; that the firſt produced all the ſoft emotions, and the latter all the violent ones. The aſſemblage of all pleaſure, he aſſerted, made true happineſs, and the beſt way to attain this was to enjoy the preſent moments.

(4.) ARISTIPPUS, WORKS, FAMILY, &c. OF. He wrote a great many books: particularly the Hiſtory of Libya, dedicated to Dionyſius; ſeveral Dialogues; and four books Of the Luxury of the Ancients. There are four of his epiſtles extant in the Socratic Collection publiſhed by Leo Allatius. Beſides Arete his daughter, whom he educated in philoſophy, Ariſtippus had alſo a ſon, whom he diſinherited for his ſtupidity. Arete had a ſon, who was named ARISTIPPUS from his grandfather, and had the ſurname of Μητροδίδακτος from his mother's inſtructing him in philoſophy. Among his auditors, beſides his daughter Arete, we have an account of Æthiops of Ptolemais, and Antipater of Cyrene. Arete communicated the philoſophy which ſhe received from her father to her ſon Ariſtippus, who tranſmitted it to Theodorus, the Atheiſt, who inſtituted the ſect called *Theodorean*. Antipater communicated the philoſophy of Ariſtippus to Epitimedes his diſciple; Epitimedes to Paræbates; Paræbates to Hegeſias and Anniceris; and theſe two laſt, improving it by ſome additions of their own, obtained the honour each of them of giving a name to the *Hegeſiac* and *Annicerian* ſects.

(II.) ARISTIPPUS, a philoſopher of the New Academy, mentioned by Laertius.

(III.) ARISTIPPUS, the author of the hiſtory of Arcadia.

(IV.) ARISTIPPUS METRODIDACTOS, the grandſon of ARISTIPPUS. See N° 1. § 4.

(1.) ARISTO, a Stoic philoſopher, the diſciple of Zeno, flouriſhed about A. A. C. 290. He differed little from his maſter. He rejected logic as of no uſe, and natural philoſophy as above the reach of human underſtanding. It is ſaid, that being bald, the ſun burnt his head; and this cauſed his death. There is a ſaying of his recorded, which might render the doctrine of Ariſtippus leſs odious than it ordinarily is: (ſee ARISTIPPUS, N° 1. § 3.) viz. "That a philoſopher might do thoſe of his hearers a prejudice who put a wrong interpretation upon good meanings; for example, that the ſchool of Ariſtippus might ſend out debauchees, and that of Zeno, Cynics:" which ſeem to imply, that the doctrine of this philoſopher never produced this effect, but when it was miſunderſtood.

(2.) ARISTO, Titus, a Roman lawyer, perfect maſter of the public and civil law, of hiſtory and antiquity. The Pandects mention ſome books of his, as does Aulus Gellius.—He was cotemporary with Pliny the younger, who gives him a noble character, *Epiſt.* 22. *lib.* i. and had a moſt tender friendſhip for him.

ARISTOBULUS, I. the ſon of John Hircanus, and nephew of Judas Maccabæus, was the firſt king of the Jews after their return from the captivity. He was alſo the firſt who united the royal and pontifical dignities, A. M. 3845. He reigned little more than a year.

ARISTOBULUS, II. the ſon of Alexander Jannæus, king of the Jews, ſucceeded his brother Hircanus, A. M. 3882, and reigned 5 years, when he was dethroned and Hircanus reſtored, A. M. 3887.

(1.) * ARISTOCRACY. *n. ſ.* [ἄριστος, greateſt, and κράτω, to govern.] That form of government which places the ſupreme power in the nobles, without a king, and excluſively of the people.—The *ariſtocracy* of Venice hath admitted ſo many abuſes through the degeneracy of the nobles, that the period of its duration ſeems to approach. *Swift.*

(2.) ARISTOCRACY is alſo often uſed for the nobility of a country, under a monarchy or any form of government. The ancient writers on politics prefer the ariſtocratical form of government to all others. Many of the moderns reckon it the very worſt. The republic of Venice exhibits an example of a moſt tyrranical ariſtocracy, worſe than even abſolute deſpotiſm. Ariſtocracy ſeems to coincide with OLIGARCHY; which, however, is more ordinarily uſed to ſignify a corruption of an ariſtocratical ſtate, where the adminiſtration is in the hands of too few, or where ſome one or two uſurp the whole power.

ARISTOCRAT, or ARISTOCRATE, } a nobleman; a member of the ariſtocracy. This is the proper and original meaning of the word; but in France, during the revolution, it was applied to all perſons, of whatever rank, who favoured the claims of the nobility, or pleaded for a diſtinction of ranks in ſociety.

* ARISTOCRATICALNESS. *n. ſ.* [from *ariſtocratical.*] An ariſtocratical ſtate. *Dict.*

* ARISTOCRATICAL. } *adj.* [from *ariſtocra-*
* ARISTOCRATICK. } *cy.*] Relating to ariſtocracy; including a form of government by the nobles.—Ockham diſtinguiſhes, that the papacy, or eccleſiaſtical monarchy, may be changed in an extraordinary manner, for ſome time, into an *ariſtocratical* form of government. *Ayliffe.*

ARISTOCRATICK GOVERNMENT. See ARISTOCRACY, N° 2.

ARISTOGITON, a famous Athenian, who, with Harmodius, killed Hipparchus, tyrant of Athens, about A. A. C. 513. The Athenians erected a ſtatue of him.

ARISTOLOCHIA, BIRTHWORT: A genus of the hexandria order, belonging to the gynandria claſs of plants; and in the natural method ranking under the 11th order, *Sarmentaceæ*. It has no calyx; the corolla conſiſts of one entire petal; and the capſule, which is below the flower, has ſix cells. The ſpecies are 21; but only the five following merit deſcription.

1. ARISTOLOCHIA CLEMATITIS, has heart-ſhaped leaves, an upright ſtem, and the flowers crowded in the axillæ. The root is long and ſlender.

2. ARISTOLOCHIA INDICA, or contrayerva of Jamaica, is a native of that iſland, where its roots are uſed inſtead of the true contrayerva. It hath long trailing branches, which climb upon the neighbouring plants, and ſometimes riſe to a conſiderable height. The flowers are produced in ſmall cluſters towards the upper part of the ſtalks, which are of a dark purple colour.

3. ARISTOLOCHIA LONGA is a native of France,

Spain, and Italy. It has long tap-roots like carrots; the branches are weak and trailing, extending little more than a foot; the flowers come out from the wings of the leaves like the other, are of a pale purple colour, and are frequently ſucceeded by ſeed-veſſels like the other.

4. ARISTOLOCHIA ROTUNDA, is alſo a native of the S. of France, Spain, and Italy, from whence the roots are brought for medical uſe. The roots are roundiſh, grow to the ſize of ſmall turnips being in ſhape and colour like the roots of cyclamens, which are frequently ſold inſtead of them. This ſort hath three or four weak trailing branches. Which lie on the ground when they are not ſupported, and extend two feet in length; the leaves are heart-ſhaped and round at their extremity; the flowers come out ſingly at every leaf, toward the upper part of the ſtalk. They are of a purpliſh black colour; and are frequently ſucceeded by oval ſeed-veſſels having ſix cells full of flat ſeeds.

5. ARISTOLOCHIA SERPENTARIA is a native of Virginia and Carolina, from whence the *radix ſerpentariæ*, or ſnake-root, ſo much uſed in medicine, is brought over. The plant riſes out of the ground in one, two, and ſometimes three pliant ſtalks, which at very little diſtance are crooked or undulated. The leaves ſtand alternately, and are about 3 inches long, in form ſomewhat like the ſmilax aſperma; they grow cloſe to the ground on foot-ſtalks an inch long, of a ſingular ſhape, and of a dark purple colour. A round canulated capſule ſucceeds the flower. It is filled with ſeeds, which are ripe in May. The uſual price of the root when dried is 6d. per pound, both in Virginia and Carolina, which is money hardly earned; yet the negro ſlaves employ great part of the time allowed them by their maſters in ſearch of it, which is the reaſon that there are ſeldom found any but very ſmall plants of this ſpecies. When planted in gardens, in countries where they are natives, they increaſe ſo much in two years, that the ſtalk of a ſingle one can ſcarce be graſped. This ſpecies is uſually found near the roots of great trees.

(II.) ARISTOLOCHIA, CULTURE OF THE. The 3 laſt ſpecies are propagated from ſeeds, which ſhould be ſown in the autumn, in pots filled with light freſh earth, and placed under a frame to preſerve them from froſt. If they are plunged into a gentle hot bed in the month of March, the plants will come up the ſooner. In ſummer and in autumn when the ſtalks begin to decay, they muſt be watered. In winter they muſt be again ſheltered; and in March, before the roots begin to ſhoot, they muſt be tranſplanted into ſmall ſeparate pots filled with light earth, when they may be removed into the open air, and treated as before. The next ſpring they may be planted in the open air in a warm border; where, in autumn, when their ſtalks decay, if the border is covered with old tanner's bark to keep out the froſt, the roots will be ſecured; but without this, they will frequently be killed by the froſt. The Indica is tender; and therefore muſt be kept in a ſtove during the winter, or it will not live in England.

(III.) ARISTOLOCHIA, MEDICINAL USES OF THE. The roots of the long and round ſorts, (N° 3. and 4.) on being firſt chewed, ſcarcely diſcover any taſte, but in little time prove naſeouſly bitteriſh; the long ſomewhat leſs. The root of the clematitis is long and ſlender, rarely exceeding the thickneſs of a gooſe-quill: it inſtantly fills the mouth with an aromatic bitterneſs, which is not ungrateful. Their medical virtues are, to heat, ſtimulate, attenuate viſcid phlegm, and promote the fluid ſecretions in general: they are principally celebrated in ſuppreſſions of female evacuations. The doſe in ſubſtance is from a ſcruple to two drams. The long ſort is recommended externally for cleanſing and drying ulcers and wounds, and in cutaneous diſeaſes. The root of the ſerpentaria is ſmall, light, buſhy, and conſiſts of a number of ſtrings or fibres, matted together, iſſuing from one common head: of a browniſh colour on the outſide, and paler or yelloviſh within. It has an aromatic ſmell, like that of valerian; but more agreeable; and a warm, bitteriſh, pungent taſte. This root is a warm diaphoretic and diuretic; it has been greatly celebrated as an alexipharmic, and eſteemed one of the principal remedies in malignant fevers and epidemic diſeaſes. In theſe intenſions, it is given in ſubſtance from 10 to 30 grains; and in infuſion, to a dram or two. Both watery and ſpirituous menſtrua extract its virtue by infuſion, and elevate ſome ſhare of its flavour in diſtillation; along with the water, a ſmall portion of eſſential oil ariſes. Theſe articles, however, are now little eſteemed; and are all baniſhed from the Pharmacopœia of the London college; the clematitis is alone retained in that of Edinburgh.

ARISTOMENES, a general of the Meſſenians, renowned for his valour and virtue. See MESSENIA.

ARISTOPHANES, a celebrated comic poet of Athens. He was cotemporary with Plato, Socrates, and Euripides; and moſt of his plays were written during the Peloponneſian war. His imagination was warm and lively, and his genius particularly turned to raillery. He had alſo great ſpirit and reſolution; and was a declared enemy to ſlavery, and to all who wiſhed to oppreſs their country. The Athenians, in his time, were governed by men, who had no other views than to make themſelves maſters of the commonwealth. Ariſtophanes expoſed their deſigns, with great wit and ſeverity, upon the ſtage. Cleo was the firſt whom he attacked, in his comedy of the *Equites*; and as none of the comedians would venture to perſonate a man of his great authority, Ariſtophanes played the character himſelf, and with ſo much ſucceſs, that the Athenians obliged Cleo to pay a fine of five talents, which were given to the poet. He deſcribed the affairs of the Athenians in ſo exact a manner, that his comedies are a faithful hiſtory of that people. When Dionyſius king of Syracuſe deſired to learn the ſtate and language of Athens, Plato ſent him the comedies of Ariſtophanes, telling him, theſe were the beſt repreſentations of them. He wrote above 50 comedies; but only 11 are extant, which are complete; viz. Plutus, the Clouds, the Frogs, Equites, the Acarnenſes, the Waſps, Peace, the Birds, the Eccleſiazuſæ or Female Orators, the Theſmophoſiazuſæ or Prieſteſſes of Ceres, and Lyſiſtrata. The Clouds, which he wrote in ridicule of Socrates, (See SOCRATES,) is the moſt cele-

celebrated of all his comedies. Madam Dacier *tells* us, that ſhe was ſo much charmed with this performance, that after ſhe had tranſlated it, and read it over 200 times, it did not become in the leaſt tedious to her, which ſhe could not ſay of any other piece; and that the pleaſure which ſhe received from it was ſo exquiſite, that ſhe forgot all the indignation which Ariſtophanes deſerved for employing his wit to ruin a man who was wiſdom itſelf, and the greateſt ornament of Athens. Ariſtophanes having ſome averſion to the poet Euripides, ſatarized him in ſome of his plays, *particularly* in his Frogs and his Theſmophoſiazuſæ. He wrote his Peace in the 10th year of the Peloponneſian war, when a treaty for 50 years was concluded between the Athenians and the Lacedæmonians, though it continued but ſeven years. The Acarnenſes was written after the death of Pericles, and the loſs of the battle in Sicily, in order to diſſuade the people from intruſting the ſafety of the commonwealth to ſuch imprudent generals as Lamachus. Soon after, he repreſented his Aves, or Birds; by which he admoniſhed the Athenians to fortify Decelæa, which he calls by a fictitious name, *Nephelococcygia*. The Veſpæ, or Waſps, was written after another loſs in Sicily, which the Athenians ſuffered from the miſconduct of Chares. He wrote the Lyſiſtrata, when all Greece was involved in a war; in which comedy the women are introduced debating upon the affairs of the commonwealth; when they come to a *reſolution*, not to go to bed with their huſbands, till a peace ſhould be concluded. His Plutus, and other comedies of that kind, were written after the magiſtrates had given orders that no perſon ſhould be expoſed by name upon the ſtage. He invented a peculiar kind of verſe, which was called by his name, and is mentioned by Cicero in his Brutus; and Suidas ſays, he was alſo inventor of the tetrameter and octameter verſe. Ariſtophanes was greatly admired among the ancients, eſpecially for the true Attic elegance of his ſtyle. The time of his death is unknown; but he was living after the expulſion of the tyrants by Thraſybulus, whom he mentions in his Plutus and other comedies. There have been ſeveral editions and tranſlations of his works. Nicomedus Friſchin. a German, famous for his claſſical knowledge, in the 16th century, tranſlated Plutus, the Clouds, the Frogs, the Equites, and the Acarnenſes, into Latin verſe. Quintus Septimus Florens rendered into Latin verſe the Waſps, the Peace, and Lyſiſtrata; but his tranſlation is full of obſolete words and phraſes. Madam Dacier publiſhed at Paris, in 1692, a French verſion of Plutus and the Clouds, with critical notes, and an examination of them according to the rules of the theatre. Mr Lewis Theobald likewiſe tranſlated theſe two comedies into Engliſh, and publiſhed them with remarks. The beſt edition of his author is that publiſhed by Ludolphus Kuſter, at Amſterdam, in folio, in 1710.

ARISTOPHANEUM, in ancient pharmacy, a kind of emolient plaſter, made of pitch, wax, opoponax, apocyma, and vinegar.

ARISTOTELIA, in antiquity, annual feaſts celebrated by the citizens of Stagiris, in honour of Ariſtotle, who was born there; and in gratitude for his having procured from Alexander the rebuilding and repeopling of that city, which had been demoliſhed by king Philip.

ARISTOTELIAN, ſomething that relates to the philoſopher Ariſtotle.

ARISTOTELIAN PHILOSOPHY, the philoſophy taught by Ariſtotle, and maintained by his followers. It is alſo called the Peripatetic philoſophy. See PERIPATETICS and ARISTOTLE, § 3.

ARISTOTELIANS, a ſect of philoſophers, called alſo *Peripatetics*. The Ariſtotelians and their dogmata prevailed long in the ſchools and univerſities; even in ſpite of all the efforts of the Carteſians, Newtonians, and other corpuſcularians. But the ſyſtems of the latter have at length gained the pre-eminence; and the Newtonian philoſophy, in particular, is now generally received. The principles of Ariſtotle's philoſophy, the learned agree, are chiefly laid down in his four books *De Cælo*; his eight books of *Phyſical Auſcultation*, φυσικης ακροασεως, belonging rather to logics, or metaphyſics, than to phyſics. Inſtead of the more ancient ſyſtems, he introduced matter, and form, and privation, as the principles of all things; but he does not ſeem to have derived much benefit from them in natural philoſophy. His doctrines are, for the moſt part, ſo obſcurely expreſſed, that it has not yet been ſatisfactorily aſcertained, what were his ſentiments on ſome of the moſt important ſubjects. He attempted to refute the Pythagoræn doctrine concerning the twofold motion of the earth; and pretended to demonſtrate, that the matter of the heavens is ungenerated, incorruptible, and ſubject to no alteration; and he ſuppoſed that the ſtars were carried round the earth in ſolid orbs. The reader will find a diſtinct account of the logical part of his philoſophy, by Dr Reid, profeſſor of moral philoſophy, in the univerſity of Glaſgow, in Lord Kames's Sketches of the Hiſtory of Man, vol. II. and Mr Harris has publiſhed a ſenſible commentary on his Categories, under the title of *Philoſophical Arrangements*.

ARISTOTELICA ROTA. See ROTA.

(1.) ARISTOTLE, the chief of the peripatetic philoſophers, born at Stagyra, a ſmall city of Macedon, in the 99th Olympiad, about 384 years before the birth of Chriſt. He was the ſon of Nicomachus, phyſician to Amyntas, the grandfather of Alexander the Great. He loſt his parents in his infancy; and Proxenes, a friend of his father's, who had the care of his education, taking but little notice of him, he quitted his ſtudies, and gave himſelf up to the follies of youth. After he had ſpent moſt of his patrimony, he entered into the army: but not ſucceeding in this profeſſion, he went to Delphos, to conſult the oracle what courſe he ſhould follow, when he was adviſed to go to Athens, and ſtudy philoſophy. He accordingly went thither about 18 years of age, and ſtudied under Plato till he was 37. By this time he had ſpent his whole fortune; and we are told, that he got his living by ſelling powders, and ſome receipts in pharmacy. He followed his ſtudies with moſt extraordinary diligence, ſo that he ſoon ſurpaſſed all in Plato's ſchool. He eat little, and ſlept leſs; and, that he might not overſleep himſelf, Diogenes Laertius tells us, that he lay always with one hand out of the bed, having a ball of braſs

braſs in it, which, by its falling into a baſon of the ſame metal, awaked him. He had ſeveral conferences with a learned Jew at Athens, who inſtructed him in the ſciences and religion of the Egyptians, and thereby ſaved him the trouble of travelling into Egypt. When he had ſtudied about 15 years under Plato, he began to form different tenets from thoſe of his maſter, who became highly piqued at his behaviour. Upon the death of Plato, he quitted Athens, and retired to Atarnya, where he married Pythias, the ſiſter of Hermias, prince of Myſia; whom he is ſaid to have loved ſo paſſionately, that he offered ſacrifice to her. Some time after, Hermias having been taken priſoner by Meranon the king of Perſia's general, Ariſtotle went to Mitylene, the capital of Leſbos, where he remained till Philip king of Macedon having heard of his great reputation, ſent for him to be tutor to his ſon Alexander, then about 14 years of age: Ariſtotle accepted the offer; and in 8 years taught him rhetoric, natural philoſophy, ethics, politics, and a certain ſort of philoſophy, which, ſays Plutarch, he taught nobody elſe. Philip erected ſtatues in honour of Ariſtotle; and for his ſake rebuilt Stagyra, which had been almoſt ruined by the wars. The laſt 14 years of his life he ſpent moſtly at Athens, ſurrounded with every aſſiſtance which men and books could afford him for proſecuting his philoſophical enquiries. The glory of Alexander's name, which then filled the world, inſured tranquillity and reſpect to the man whom he diſtinguiſhed as his friend: but after his premature death, the invidious jealouſy of prieſts and ſophiſts inflamed the ſuperſtitious fury of the Athenian populace; and the ſame odious paſſions which proved fatal to the offenſive virtue of Socrates, fiercely aſſailed the fame and merit of Ariſtotle. To avoid their perſecution he withdrew to Chalcis, a meaſure ſufficiently juſtified by a regard to perſonal ſafety; but leaſt his conduct ſhould appear unmanly, when contraſted with the firmneſs of Socrates, he apologized for his flight, by ſaying, that he was unwilling to afford the Athenians a ſecond opportunity "to ſin againſt philoſophy." He ſeems to have ſurvived his retreat from Athens only a few months; vexation and regret probably ended his days.

(2.) ARISTOTLE, HISTORY OF THE WORKS OF. Beſides his treatiſes on philoſophy, he wrote alſo on poetry, rhetoric, law, &c. to the number of 400 treatiſes, according to Diogenes Laertius. An account of ſuch as are extant, and of thoſe ſaid to be loſt, may be ſeen in Fabricius's *Bibliotheca Græca*. He left his writings with Theophraſtus, his beloved diſciple and ſucceſſor in the Lyceum; and forbade that they ſhould ever be publiſhed. Theophraſtus, at his death, truſted them to Neleus, his friend and diſciple; whoſe heirs buried them in the ground at Scepſis, a town of Troas, to ſecure them from the king of Pergamos, who made great ſearch every where for books to adorn his library. Here they lay concealed 160 years, until, being almoſt ſpoiled, they were ſold to one Apellicon, a rich citizen of Athens. Sylla found them at this man's houſe, and ordered them to be carried to Rome. They were ſome time after purchaſed by Tyrannion a grammarian; and Andronicus of Rhodes having bought them of his heirs, was the firſt reſtorer of the works of this great philoſopher; for he repaired what had been decayed, and got them copied.

(3.) ARISTOTLE'S PHILOSOPHY, HISTORY OF. Many followed the doctrine of Ariſtotle in the reigns of the 12 Cæſars, and their numbers increaſed much under Adrian and Antoninus. Alexander Aphrodinus was the firſt profeſſor of the Peripatetic philoſophy at Rome, being appointed by the emperors Marcus Aurelius and Lucius Verus; and in ſucceeding ages the doctrine of Ariſtotle prevailed among almoſt all men of letters, and many commentaries were written upon his works. The firſt doctors of the church diſapproved of the doctrine of Ariſtotle, as allowing too much to reaſon and ſenſe; but Anatolius, biſhop of Loadicea, Didymus of Alexandria, St Jerome, St Auguſtin, and ſeveral others, at laſt wrote and ſpoke in favour of it. In the 6th century Boethius made it known in the weſt, and tranſlated ſome of his pieces into Latin. But from the time of Boethius to the 8th age, Joannes Damaſcenus was the only man who made an abridgement of his philoſophy, or wrote any thing concerning him. The Grecians, who took great pains to reſtore learning in the 11th and following centuries, ſtudied much the works of this philoſopher, and many learned men wrote commentaries on his writings: amongſt theſe were Alfaragius, Algazel, Avicenna, and Averroes. They taught his doctrine in Africa, and at Cordova in Spain. The Spaniards introduced it into France, with the commentaries of Averroes and Avicenna; and it was taught in the univerſity of Paris, until Amouri, having ſupported ſome particular tenets on the principles of this philoſopher, was condemned of hereſy, in a council held there in 1210, when all the works of Ariſtotle that could be found were burnt, and reading of them forbidden under pain of excommunication. This prohibition was confirmed, as to the phyſics and metaphyſics, in 1215, by the pope's legate; though at the ſame time he gave leave for his logic to be read, inſtead of St Auguſtin's, uſed at that time in the univerſity. In 1265, Simon, cardinal of St Cecil, and legate from the holy ſee, prohibited the reading of the phyſics and metaphyſics of Ariſtotle. All theſe prohibitions however, were taken off in 1366; for the cardinals of St Mark and St Martin, who were deputed by Pope Urban V. to reform the univerſity of Paris, permitted the reading of thoſe books which had been prohibited: and in 1448, Pope Stephen approved of all his works, and procured a new tranſlation of them into Latin.

ARISTOTUS, in ichthyology, the ſhad, ſo called by Albertus and others. See CULPEA and THRISSA.

ARISTOXENUS, the moſt ancient muſical writer, of whoſe works any tracts are come down to us, was born at Tarentum. He was the ſon of a muſician, whom ſome call *Mnaſeas*, others *Spintharus*. He had his firſt education at Mantinæa, under his father, and Lamprus of Erythræ; he next ſtudied under Xenophilus, the Pythagorean; and laſtly under Ariſtotle, in company with Theophraſtus. Suidas adds, that Ariſtoxenus, enraged at Ariſtotle having bequeathed his ſchool

to

to Theophraſtus, traduced him ever after. But Ariſtocles the Peripatetic, in Euſebius, exculpates Ariſtoxenus, and aſſures us that he always ſpoke with great reſpect of Ariſtotle. Ariſtoxenus lived under Alexander the Great and his firſt ſucceſſors. His *Harmonics* in 3 books, (all that have reached us,) together with Ptolemy's Harmonics, were firſt publiſhed by Gogavinus, at Venice, in 1562, 4to, with a Latin verſion. John Meurſius next tranſlated theſe 3 books into Latin from the MS. of Joſ. Scaliger. With theſe he printed at Leyden, in 1616, 4to, Nicomachus and Alypius, two other Greek writers on muſic. Meibomius collected theſe muſical writers together; to which he added Euclid, Bacchus ſenior, and Ariſtides Quintilianus; and publiſhed the whole, with a Latin verſion and notes, from the elegant preſs of Elzevir, Amſt. 1652, and dedicated them to Chriſtina queen of Sweden. Ariſtoxenus is ſaid by Suidas to have written 452 different works, among which thoſe on muſic were the moſt eſteemed; yet his writings on other ſubjects are frequently quoted by ancient authors, notwithſtanding Cicero and others ſay, he was a bad philoſopher, and had nothing in his head but muſic. The titles of ſeveral of the loſt works of Ariſtoxenus, quoted by Athenæus and others, have been collected by Meurſius in his notes upon this author, by Tonſius and Menage, all which Fabricius had digeſted into alphabetical order.

* ARITHMANCY. *n. ſ.* [from *ἀριθμος*, number, and *μαντεια*, devination.] A fortelling future events by numbers. *Diſſ.*

ARITHMETIC.

INTRODUCTION.

SECT. I. ETYMOLOGY, *and* DEFINITION *of* ARITHMETIC.

1.) ARITHMETIC, [from *ἀριθμος*, number, and *μετρεω*, to meaſure,] is a ſcience which explains the properties of numbers, and ſhows the method or art of computing by them. The late Dr Robertſon juſtly ſtiles it the moſt perfect of the ſciences.

SECT. II. HISTORY *of* ARITHMETIC.

(2.) At what period Arithmetic was firſt introduced into the world, we can by no means determine. That ſome part of it, however, was coeval with the human race is abſolutely certain. We cannot conceive how any man endowed with reaſon can be without ſome knowledge of numbers. We are indeed told of nations in America who have no word in their language to expreſs a greater number than three, which they call *petarraroincouroac*: but that ſuch nations ſhould have no idea of a greater number than this, is abſolutely incredible. Perhaps they may compute by threes, as we compute by tens; and this may have occaſioned the notion that they have no greater number than three.

(3.) But though we cannot ſuppoſe any nation or indeed any ſingle perſon, ever to have been without ſome knowledge of the difference between greater and ſmaller numbers, it is poſſible that mankind may have ſubſiſted for a conſiderable time without bringing this ſcience to any perfection, or computing by any regular ſcale, as 10, 12, &c. That this, however, was very early introduced into the world, even before the flood, we may gather from the following expreſſion in Enoch's prophecy, as mentioned by the apoſtle Jude: "Behold, the Lord cometh with *ten thouſands* of his ſaints." This ſhows, that even at that time men had ideas of numbers as high as we have in this day, and computed them alſo in the ſame manner, namely by tens.

(4.) The directions alſo given to NOAH, concerning the dimenſions of the ark, leave us no room to doubt that he had a knowldge of both numbers, and meaſures. When Rebekah was ſent away to Iſaac, Abraham's ſon, her relations wiſhed ſhe might be the mother of *thouſands and millions*; and if they were totally unacquainted with the rule of multiplication, it is difficult to ſee how ſuch a wiſh could have been formed. It is probable, therefore, that the four fundamental rules of arithmetic have always been known to ſome nation or other.

(5.) Some nations, however, like the Europeans formerly, and the Africans and Americans now, have doubtleſs been immerſed in the moſt abject and deplorable ſtate of ignorance; and might therefore remain for ſome time unacquainted with numbers, except ſuch as they had immediate occaſion for. And, when they came afterwards to improve, either from their own induſtry, or hints given by others, they might fancy that they themſelves, or thoſe from whom they got the hints, had invented what was known long before.

(6.) Dr Chambers thinks it highly probable, that arithmetic, as a ſcience, muſt have taken its riſe from the introduction of commerce; and conſequently that it ſhould be of Tyrian invention.

(7.) From Aſia it paſſed into Egypt, ſays Joſephus, by means of ABRAHAM. Here it was greatly cultivated and improved; inſomuch that a large part of the Egyptian philoſophy and theology ſeems to have turned altogether upon numbers. Hence thoſe wonders related by them about unity, trinity, the numbers ſeven, ten, four, &c. In fact, Kircher, (in his *Oedip. Ægypt. tom.* 2. *p.* ii.) ſhews, that the Egyptians explained every thing by numbers. Pythagoras affirms, that the nature of numbers goes through the whole univerſe; and that the knowledge of numbers is the knowledge of the Deity.

(8.) From Egypt arithmetic was tranſmitted to the Greeks, who were doubtleſs the firſt European nation among whom arithmetic arrived at any degree of perfection. M. Goguet is of opinion, they uſed pebbles in their calculations: a proof

proof of which he imagines, is, that the word ψηφίζω which comes from ψῆφος, a little ſtone, or flint, among other things, ſignifies *to calculate*. The ſame he thinks, is probable of the Romans; and derives the word *calculation* from the uſe of little ſtones (*calculi*) in their firſt arithmetical operations.

(8.) This method, however, muſt have been but for a ſhort time, ſince we find the Greeks very early made uſe of the letters of the alphabet, taken according to their order, at firſt denoting the numbers 1, 2, 3, 4, 5, 7, 8, 9, 10, 20, 30, 40, 50, 60, 70, 80, 100, 200, 300, 400, 500, 600, 700, and 800; to which they added the three following, ϛ, ϟ, ϡ, to repreſent 6, 90, and 900. The difficulty of performing arithmetical operations by ſuch marks as theſe may eaſily be imagined, and is very conſpicuous from Archimedes's treatiſe concerning the dimenſions of a circle.

(10.) A a ſimilar method was followed by the Romans: and beſides characters for each rank of claſſes, they introduced others for five, fifty, and five hundred. Their method is ſtill uſed for diſtinguiſhing the chapters of books, and ſome other purpoſes. Their numeral letters and values are the following:

I V X L C.
One, five, ten, fifty, one hundred,
D M
Five hundered, one thouſand.

(11.) Any number, however great, may be repreſented by repeating and combining theſe according to the following rules:

1ſt, When the ſame letter is repeated twice, or oftener, its value is repreſented as often. Thus II ſignifies two: XXX thirty, CC, two hundred.

2d, When a numeral letter of leſſer value is placed after one of greater, their values are added thus XI ſignifies eleven, LXV ſixty-five, DCVIII ſignifies ſix hundred and eight, MDCXXVIII one thouſand ſix hundred and twenty eight.

3d, When a numeral letter of leſſer value is placed before one of greater, the value of the leſſer is taken from that of the greater: thus IV ſignifies four, XL forty, XC ninety, CD four hundred.

(12.) Sometimes Iↀ is uſed inſtead of D for 500, and the value is increaſed ten times by annexing ↀ to the right hand.

Thus Iↀ ſignifies 500. Alſo Cↀ is uſed for 1000
Iↀↀ 5000 CCↀↀ for 10000
Iↀↀↀ 50000 CCCↀↀↀ for 100000

(13.) Sometimes thouſands are repreſented by drawing a line over the top of the numeral, $\overline{V}$ being uſed for five thouſand, $\overline{L}$ for fifty thouſand, $\overline{CC}$ two hundred thouſand.

(14.) A new kind of arithmetic, called SEXAGESIMAL, was invented, as is ſuppoſed, by CLAUDIUS PTOLOMÆUS, about A. D. 200. The deſign of it was to remedy the difficulties of the common method, eſpecially with regard to fractions. In this kind of arithmetic, every unit was ſuppoſed to be divided into 60 parts, and each of theſe into 60 others, and ſo on: hence any number of ſuch parts were called *ſexageſimal fractions*; and to make the computation in whole numbers more eaſy, he made the progreſſion in theſe alſo ſexageſimal. Thus from one to 59 were marked in the common way: then 60 was called a *ſexageſima prima*, or firſt ſexageſimal integer, and had one ſingle daſh over it; ſo 68 was expreſſed thus I′; and ſo on to 60 times 60, or 3540, which was thus expreſſed LIX′. He now proceeded to 60 times 60, which he called a *ſexageſima ſecunda*, and was thus expreſſed I″. In like manner, twice 60 times 60, or 7200, was expreſſed by II″; and ſo on till he came to 60 times 3600, which was a third ſexageſimal, and expreſſed thus, I‴. If any number leſs than 60 was joined with theſe ſexageſimals, it was added in its proper characters without any daſh; thus I′XV repreſented 60 and 15, or 75; I′VXXV is four times 60 and 25, or 265; X″II′XV, is ten times 3600, twice 60 and 15, or 36,135, &c. Sexageſimal fractions were marked by putting the daſh at the foot or on the left hand of the letter; thus I,, or ′I, denoted $\frac{1}{60}$; I,, or ″I, $\frac{1}{3600}$, &c.

(15.) The numeral characters which we now uſe, and which are doubtleſs the moſt perfect method of notation, came into Europe from the ARABIANS by the way of Spain. The Arabs however, do not pretend to be the inventors of them, but acknowledge that they received them from the Indians.

(16.) Some, indeed, contend that neither the Arabs nor the Indians were the inventors, but that they were found out by the Greeks. But this is by no means probable; as Maximus Planudes, who lived towards the cloſe of the 13th century, is the firſt Greek who makes uſe of them: and he is plainly not the inventor; for Dr Wallis mentions an inſcription on a chimney in the parſonage houſe of Helendon in Northamptonſhire, where the date is expreſſed by M°1°3°, inſtead of 1133. Mr Luffkin furniſhes a ſtill earlier inſtance of their uſe, in the window of a houſe part of which is a Roman wall near the market-place in Colcheſter; where between two carved lions ſtands an eſcutcheon with the figures 1070. Dr Wallis is of opinion that theſe characters muſt have been uſed in England at leaſt as long ago as the year 1050, if not in ordinary affairs, at leaſt in mathematical ones, and in the aſtronomical tables. How theſe characters came to be originally invented by the Indians we are entirely ignorant.

(17.) The introduction of the Arabian characters in notation did not immediately put an end to the ſaxgeſimal arithmetic. As this had been uſed in all the aſtronomical tables, it was for their ſakes retained a conſiderable time. The ſexageſimal integers went firſt out, but the fractions continued till the invention of decimals.

(18.) The moſt ancient treatiſes extant upon the theory of arithmetic are the 7th, 8th, and 9th books of EUCLID's elements, where he treats of proportion and of prime and compoſite numbers, both of which have received improvements ſince his time, eſpecially the former.

(19.) The next of whom we know any thing is NICOMACHUS the Pythagorean, who wrote a treatiſe of the theory of arithmetic, conſiſting chiefly of the diſtinctions and diviſions of numbers in claſſes, as plain, ſolid, triangular, quadrangular, and the reſt of the figurate numbers as they are called, numbers odd and even, &c. with ſome of the more general properties of the ſeveral kinds.

The

This author is by ſome, ſaid to have lived before the time of Euclid; by others, not long after. His arithmetic was publiſhed at Paris in 1538.

(20.) The next remarkable writer on this ſubject is BOETHIUS, who lived at Rome in the time of Theodoric the Goth. He is ſuppoſed to have copied moſt of his work from Nicomachus. A compendium of the ancient arithmetic, written in Greek, by PSELLUS, in the ninth century from our Saviour, was given us in Latin by XYLANDER, in 1556.

(21.) From this time no remarkable writer on arithmetic appeared till about the year 1200, when JORDANUS of Namur wrote a treatiſe on this ſubject, which was publiſhed and demonſtrated by Joannes Faber Stapulenſis in the 15th century, ſoon after the invention of printing. The ſame author alſo wrote upon the new art of computation by the Arabic figures, and called this book *Algoriſmus Demonſtratus*. Dr Wallis ſays this manuſcript is in the Savillian library at Oxford, but it hath never yet been printed.

(22.) As learning advanced in Europe, ſo did the knowledge of numbers; and the writers on arithmetic ſoon became innumerable. About the year 1464, REGIOMONTANUS, in his triangular tables, divided the Radius into 10,000 parts inſtead of 60,000, and thus tacitly expelled the ſexageſimal arithmetic. Part of it, however, ſtill remains in the diviſion of time, as of an hour into 60 minutes, a minute into 60 ſeconds, &c.

(23.) RAMUS in his arithmetic, written about A. D. 1550, and publiſhed by Lazarus Schonerus in 1586, uſes decimal periods in carrying on the ſquare and cube roots to fractions. The ſame had been done before by our countrymen BUCKLEY and RECORD; but the firſt who publiſhed an expreſs treatiſe on decimals was SIMON STEVINIUS, about the year 1582.

(24.) BARLAAMUS MONACHUS alſo gave a theory for demonſtrating the common operations, both in integers and broken numbers, in his Logiſtica, publiſhed in Latin by J. Chambers, an Engliſhman, in 1600.—And LUCAS DE BORGO, in an Italian treatiſe, publiſhed in 1523, gave the ſeveral diviſions of numbers from Nicomachus, and their properties from Euclid; with the algorithm, both in integers, fractions, extractions of roots, &c.

(25.) The firſt entire body of practical arithmetic, was given by NIC. TARTAGLIA, a Venetian, in 1556, conſiſting of two books; 1. the application of arithmetic to civil uſes; 2. the grounds of algebra. Something had been done before by STIFELIUS, in 1544, where we have ſeveral particulars concerning the application of irrationals, coſſics, &c. no where elſe to be met with.

(26.) We omit other more practical authors, who have followed ſince, the number whereof is almoſt infinite; as Gemma, Friſius, Metius, Clavius, Digges, Wingate, Cocker, Leyburn, Malcolm, &c. &c. The theory of arithmetic is joined with the practice, and even improved in ſeveral parts, by Maurolycus, in his *Opuſcula Mathematica*, 1575; by Heneſchius, in his *Arithmetica Perfecta*, 1609, where the demonſtrations are all reduced into the form of ſyllogiſms; and by Tacquet, in his *Theoria & Praxis Arithmeticæ*, 1704.

(27.) As to the circulating decimals, Dr WALLIS, is the firſt who took much notice of them. He is alſo the author of the ARITHMETIC OF INFINITES, which has been very uſefully applied to geometry.

(28.) The greateſt improvement, however, which the art of computation ever received, is the invention of LOGARITHMS. The honour of this invention is unqueſtionably due to LORD NAPIER, of Merchiſton in Scotland, about the end of the 16th or beginning of the 17th century. By theſe means arithmetic has advanced to a degree of perfection which the ancients could never have imagined poſſible, much leſs hoped to attain; and we believe it may now be reckoned one of thoſe few ſciences which have arrived at their utmoſt height, and which is in its nature capable of little further improvement.

SECT. III. DIVISIONS *of* ARITHMETIC.

(29.) This Science has been variouſly divided by different authors, according to the limits they preſcribed to their treatiſes, or the peculiar mode of arrangement they adopted; ſuch as *Vulgar* and *Decimal*; *Theoretical* and *Practical*; *Numerous* and *Specious*; *binary*, *duodecimal*, *dynamical*, *inſtrumental*, *logarithmical*, *ſexageſimal*, *tetractical*, &c. upon which it is unneceſſary here to enlarge, as none of them ſeem properly adapted to a work of this kind, and the terms are explained in their order.

(30.) The mode of diviſion and arrangement we have adopted in this treatiſe, we are perſuaded will be found, not only in ſome degree new, but full as proper, as any yet attempted by our predeceſſors, or cotemporaries.

PART I.

SIMPLE ARITHMETIC.

SECT. I. NOTATION *and* NUMERATION.

(31.) NOTATION is the expreſſing of any propoſed number, either by words or characters. All numbers are expreſſible by theſe ten characters or figures; 1 2 3 4 5 6 7 8 9 0

One, two, three, four, five, ſix, ſeven, eight, nine, cypher. The nine firſt are called *ſignificant figures* or *digits*. When placed ſingly, they denote the ſimple numbers ſubjoined to the characters. The uſual method of motion by theſe figures is ſo contrived, that any character is increaſed in its value in a tenfold proportion, for every place it is removed to the left, among the other figures with which it is connected. Thus, in theſe figures 333, the firſt 3 (reckoning from the right to the left) is 3 ones; the ſecond is 3 tens, and the third is 3 hundreds; in theſe 2759, the 9 repreſents 9 ones, and the 5 repreſents 5 tens, the 7 is 7 hundreds, and the 2 is 2 thouſand. And although the cypher ſignify nothing by itſelf, yet when put on the right of any of the other figures, it increaſeth their value in the ſame tenfold proportion above deſcribed, merely by changing their poſition from the place of units to that of tens. Thus, though 2 ſtanding alone, or in the firſt place, repreſents only two ones, yet when

a cypher is written on the right of it thus, 20, it repreſents 2 tens, or twenty; and if another cypher be affixed thus, 200, it will repreſent 2 hundreds, &c.

(32.) It has been ſaid, that "there does not ſeem to be any number naturally adapted for conſtituting a claſs of the loweſt, or any higher rank to the excluſion of others; that however, as ten has been univerſally uſed for this purpoſe by moſt nations who have cultivated this ſcience, it is probably the moſt convenient for general uſe. Other ſcales (it is alledged,) may be aſſumed: thus, if eight were the ſcale, 6 times 3 would be two claſſes and two units, and the number 18 would then be repreſented by 22. If 12 were the ſcale, 5 times 9 would be three claſſes and nine units, and 45 would be repreſented by 39, &c.

(33.) But this theory ſeems far from being ſupported by fact. The univerſality of the practice of reckoning by tens is allowed even by thoſe who plead for it. The antiquity of it, which as above obſerved, (§ 3,) is antediluvian, might alſo be urged, as an evidence that it is the moſt natural claſſification of numbers. But this is not all. There ſeems to be a regularity of gradation from the loweſt to the higheſt poſſible numbers, and uniformity of proportion in reckoning them, upon the decadary plan, that is unattainable, if not impracticable by adopting any other mode, or any higher or lower number as the limit of a claſs. An additional argument may be drawn from conſidering how we firſt acquire our ideas of numbers.

(34.) The firſt elements of arithmetic are acquired during our infancy: for, when a child gathers as many ſtones together as ſuits his fancy, and then throws them away, he, acquires the firſt elements of the two capital operations in arithmetic, addition and ſubtraction. Small numbers are moſt eaſily apprehended: a child ſoon knows what *two* and what *three* is; but has not any diſtinct notion of *twenty-three*. Experience removes his difficulty by degrees, and he becomes accuſtomed to handle larger collections, and to form many units into a claſs, and ſeveral of theſe claſſes into one of a higher kind, and thus to advance through as many ranks of claſſes as occaſion requires. If a boy arrange an hundred ſtones in one row; he would with difficulty reckon them; but if he place them in ten rows of ten ſtones each, he will reckon an hundred with eaſe; and if he collect ten ſuch parcels, he will reckon a thouſand.

(35.) But ſuppoſe a teacher ſhould adopt the mechanical method of teaching a boy arithmetic, and ſhould at the ſame time take it into his head to reckon by *ſevens* or *nines* inſtead of *tens*, we may readily believe, he would find it a very difficult taſk to make his pupil entertain any accurate idea of the proportions between the larger and ſmaller numbers, whatever denomination ſuch a fanciful arithmetician might give them. The ancient Greeks and Romans would have brought the ſcience of arithmetic to a much greater degree of perfection, than they ever did, had they hit upon the method of expreſſing by TEN DISTINCT CHARACTERS the numbers by which they reckoned. But the idea of a CYPHER, which can only be introduced into the *decadary* ſyſtem, and which may be ſtiled the KEY-STONE *of* ARITHMETIC, ſeems never to have ſtruck them; and thus, though they reckoned properly enough by tens, yet not having characters proportionate to expreſs their numbers, they involved their arithmetic in a labyrinth of confuſion, from which neither a EUCLID, nor an ARCHIMEDES, with all their wonderful mechanical powers, were able to extricate it for want of this clue. In a word, it is to the cypher, in uniform alteration with the nine digits, that the moderns owe the honour of having PERFECTED A SCIENCE, in which the ancients, with all their great attainments, had made but ſmall progreſs. And perhaps, if all our modern weights and meaſures, were divided and ſubdivided upon the decadary plan, inſtead of into *fourths*, *eighths*, *twelfths*, *ſixteenths*, &c. that general uniformity: both, ſo long wanted, might be ſoon attained.

(36.) NUMERATION implies the numbering or reading of numerical characters; or the reckoning any number of things by them. For the more eaſy numbering, and expeditious reading of large numbers, when they are expreſſed by figures, they are divided from the right hand towards the left into periods and half periods, and each period conſiſting of three figures; the common name of the firſt period being units, or ones; of the ſecond, millions, of the third billions; of the fourth trillions, &c. Alſo the firſt half of any period is ſo many ones of it, but the latter half is ſo many thouſands of it. The following example exhibits a ſummary of this whole doctrine, and may be extended to ſextillions, ſeptillions, octillions, noxillions, &c. *ad infinitum*.

Quintillions.			*Quadrillions.*			*Trillions.*			*Billions.*			*Millions.*			*Units.*		
Hundred thouſands.	Ten thouſands.	Thouſands.	Hundreds.	Tens.	Units.	Hundred thouſands.	Ten thouſands.	Thouſands.	Hundreds.	Tens.	Units.	Hundred thouſands.	Ten thouſands.	Thouſands.	Hundreds.	Tens.	Units.	Hundred thouſands.	Ten thouſands.	Thouſands.	Hundreds.	Tens.	Units.
9	8	7,	6	5	4,	3	2	1,	9	8	7,	6	5	4,	3	2	1,	9	8	7,	6	5	4,	3	2	1

A number expreſſing a quantity of one name or denomination, is called a *ſimple number*, as 20 pounds, or 17 gallons, or 5 days; and that repreſenting a quantity of ſeveral names, is called a *compound number*, as 13 pounds 5 ſhillings and 3 pence, or 17 gallons and 2 pints, or 3 hours and 50 minutes.

(37.) Hence

(37.) RULE.—*To* READ *or* EXPRESS *in* WORDS, *any* NUMBER *expreſſed in* FIGURES.

Divide the figures in the given number, as in the general example above, into periods and half periods, by any convenient marks; then beginning at the left, the figures are thus read, viz. the firſt figure of each half period is named by itſelf with the word *hundreds*, but the other two are named together; and at the end of the firſt half of each period, the word *thouſands* is named; but at the end of the other half, the common name of the whole period, except it be the units period, whoſe name is not expreſſed.

SECT. II. SIMPLE ADDITION.

(38.) Simple Addition is the finding of one ſimple number equal to ſeveral ſimple numbers taken all together. The number which is equal to ſeveral taken together is called their ſum.

(39.) SIMPLE ADDITION may be performed by this RULE.

1. Place the ſeveral numbers, to be added, underneath each other, ſo that the figures of the ſame name, with reſpect to units, tens, &c. may be directly under each other.

2. Draw a line under the loweſt number; then add up the column of units, and conſider how many tens are in the ſum, for which you muſt carry ſo many ones to the next column, writing down only the exceſs over and above the tens, below the line ſtraight under its proper column.

3. Add all the columns in the ſame manner, and the figures below the line will expreſs the ſum required.

(40.) PROOF. Cut off the uppermoſt number, by drawing a line below it. Add all the reſt of the lines of numbers together, and ſet their ſum below the ſum to be proved. Then add this laſt found number and the uppermoſt line together, and the ſum will be the ſame as that found by the firſt addition, when the work is all right.

EXAMPLES.

2591	39481
45927	22
621	6185
13248	17293
7931	26817
70318	89798

SECT. III SIMPLE SUBTRACTION.

(41.) Simple ſubtraction is the finding how much one ſimple number exceeds another, or the taking a leſs ſimple number out of a greater. The number to be ſubtracted is called the SUBTRAHEND; and that out of which it is to be taken, is called the MINUEND: alſo the number remaining after the one is taken out of the other, is named their *difference*.

(42.) SIMPLE SUBTRACTION is performed by the following RULE.

1. Place the ſubtrahend under the minuend according to the directions given in addition, and draw a line below them.

2. Begin at the right, and ſubtract each under figure from that which ſtands above it, writing the remainder ſtraight under them below the line ſo ſhall all the remainders together expreſs the difference required.

3. But when any under figure exceeds that which is above it, conceive 10 to be added to the upper, and ſubtract the under from the ſum; but in this caſe, you muſt add 1 to the next under figure, before you ſubtract it.

(43.) PROOF. Add the difference and ſubtrahend together, and the ſum will be equal to the minuend when the operation is right.

EXAMPLE. Minuend, 159327
Subtrahend, 61489
97838

PROOF, 159327

SECT. IV. SIMPLE MULTIPLICATION.

(44.) Simple multiplication is the finding of a ſimple number, which ſhall contain any given ſimple number a certain propoſed number of times; and it is therefore a compendious method of addition.

(45.) The two propoſed numbers are in general, termed the FACTORS of the multiplication; but in particular, that which is to be multiplied, is called the MULTIPLICAND; and that by which it is multiplied, the MULTIPLIER; the number found from the operation is named the PRODUCT of the two factors.

(46.) Before proceeding to any operations in this rule, the following table of products muſt be got by heart very perfectly:

MULTIPLICATION TABLE.

1	2	3	4	5	6	7	8	9
2	4	6	8	10	12	14	16	18
3	6	9	12	15	18	21	24	27
4	8	12	16	20	24	28	32	36
5	10	15	20	25	30	35	40	45
6	12	18	24	30	36	42	48	54
7	14	21	28	35	42	49	56	63
8	16	24	32	40	48	56	64	72
9	18	27	36	45	54	63	72	81

(47.) SIMPLE MULTIPLICATION may be performed by the two following RULES.

I. *To* MULTIPLY *by any* NUMBER *in the* FIRST LINE *of the foregoing* TABLE *of* PRODUCTS.—Begin at the right of the multiplicand, and multiply each figure in it by the multiplier, writing down the whole of ſuch products as are leſs than ten; but for ſuch as are juſt equal to a certain number of tens, write down 0, and carry 1 for each 10 to the next product; and for ſuch as exceed a number of tens, write down the exceſs, and carry for the tens as before.

II. *To* MULTIPLY *by a* NUMBER *conſiſting of* SEVERAL FIGURES.

2. Write it below the multiplicand, and find the product for each figure in it as in the firſt caſe, not regarding in what order the lines are found, provided the firſt figure in each, ſtand ſtraight below its reſpective multiplier.

2. Add all the lines of products together in the ſame order as they ſtand, and the ſum will be the whole product required.

(48.) PROOF. Make the former multiplicand the multiplier, and the multiplier the multiplicand, and proceed as before; and the due product will be the ſame as before when the work is right. *Otherwiſe*, add together the figures in each factor, caſting out all the nines in the ſums as often as they amount to nine. Multiply the two remainders together, and the nines caſt out of their product will leave the ſame remainder as the nines caſt out of the anſwer when the work is right.

EXAMPLES.

8576	2375 multiplicand,
7	38 multiplier,
60032	19000
	7125
	90250 product.

(49.) CONTRACTIONS.

I. When there are cyphers at the right of one or both factors, proceed as before, neglecting the cyphers; and to the right of the product, place as many cyphers as are in both factors.

Thus, to multiply 134 by 2700, multiply 134 by 27, and to the product 3168 join two cyphers, and we get 361800, the product required,

II. When the multiplier is the product of two or more numbers in the table, it is often of advantage to multiply continually by thoſe numbers inſtead of it.

Thus, to multiply 7964 by 72, or the product of 9 and 8, multiply by 9 and the product 71676, again by 8, thus we get 573408, the product required.

III. When ſome of the figures of the multiplier may be produced by multiplying ſome others of them by any number, it is much eaſier and more conciſe after having obtained the product of the leſs, to multiply that product by the ſame number for the product of the greater, than to proceed by the common method.

SECT. V. SIMPLE DIVISION.

(50). Simple diviſion is the finding how often one ſimple number is contained in another; or the dividing of any given ſimple number into any propoſed number of equal parts.

(51.) The containing number, or number to be divided, is called the DIVIDEND. The contained number, or the number of parts into which the dividend is divided, is called the DIVISOR. The number of times the dividend contains the diviſor or the number which expreſſes one of the equal parts, is called the QUOTIENT, thus:

Dividend.
Diviſor 3) 12 (4 Quotient.

Diviſion is a compendious ſubtraction, the quotient being the number of ſubtractions in the operation.

(52.) SIMPLE DIVISION may be performed by the following RULE:

1. Having written down the diviſor and dividend in the form above, conſider if the diviſor be leſs than, or equal to, the ſame number of the left hand figures of the dividend; if ſo, write the figure expreſſing the number of times it is contained, in the quotient; but if not, take one place more of the dividend figures than are in the diviſor, and write the number of times they contain it in the quotient as before.

2. Multiply the diviſor by the quotient figure.

3. Subtract the product from the ſaid dividend figures.

4. To the remainder affix the next dividend figure, and write in the quotient the number of times the diviſor is contained in this number; multiply the diviſor by the laſt quotient figure, and ſubtract the product from the laſt mentioned number; then proceed as before from the beginning of this article, till all the dividend figures are uſed.

(53.) PROOF. Multiply the quotient by the diviſor; to the product add the remainder, and the ſum will be equal to the dividend when the work is right.

EXAMPLE.

372)58247(156
372
2104
1860
2447
2232
remainder 215

(54.) CONTRACTIONS.

I. Diviſion by a ſingle figure, or by any figure in the firſt line of the multiplication table, may be expeditiouſly performed by multiplying and ſubtracting mentally, and writing down only the quotient below the dividend.

EXAMPLE. 7)579325
827604

II. When the diviſor has cyphers on the right of it, ſtrike them off, and divide without them; but the ſame number of figures muſt be ſtruck off from the right of the dividend, and affixed to the laſt remainder.

EXAMPLE. 8,00)5734.21
$716\frac{61}{80}$

III. When the diviſor is the product of 2 or more ſmall numbers, it is much eaſier to divide continually by thoſe numbers, than by the whole diviſor at once. If there be any remainders after ſuch diviſions, multiply the laſt remainder by the preceding diviſor, and to the product add the remainder belonging to the ſame diviſor: then multiply the ſum by the next preceding diviſor, and to the product add its correſponding remainder: proceed in the ſame manner through all the diviſors and remainders; and the laſt ſum will be the remainder,

emainder, the ſame as if the diviſion had been erformed at once. After this operation is begun, muſt be continued according to the deſcription, ough ſome of the preceding diviſions ſhould appen to have no remainders. So to divide 2901685 by 96 whoſe component parts are 8 and 2; divide the firſt by 8, and this quotient by the 2, and the remainders are 5 and 6; then 6 times are 48, to which add the 5, and the ſum 53 is e whole remainder to the whole diviſor 96.

8)42901685
12) 5362710 5/8
Quotient 446892 53/96

IV. One who is pretty ready in diviſion, may, en in the largeſt diviſions, ſubtract each figure of e product as he produces it, and write down ly the remainders.

EXAMPLE. 833) 3104679 (3727 88/833.
6056
2257
5919
88

SECT. VI. REDUCTION.

(55.) Reduction is the converſion of numbers om one name to another, but ſtill retaining the me value. If the reduction be to a leſs name it is ommonly called reduction DESCENDING; but if a greater, reduction ASCENDING.

(56.) RULE. Conſider how many of the leſs name ncerned make 1 of the greater, and by that mber multiply the given number if the reduc- on be deſcending, but divide if aſcending, and e product or quotient will be the value in the her name. When there are names between the opoſed and required ones, it is beſt to reduce e propoſed to the next leſs or greater name, and is to the next leſs or greater again, and ſo on, l you have reduced it to the name required.— Then, in reduction deſcending, the propoſed is compound number, you muſt add, or take in e ſmall numbers in the name below the greateſt, the ſame names, as you proceed in the reduc- on. When, in reduction aſcending, you have y remainders after dividing, they will have the ne names as their reſpective dividends, and may placed after the laſt quotient according to the der of their names, the greateſt firſt; ſo ſhall e compound number thus formed be the anſwer.

(57.) OF MONEY.

Farthings.	Pence.	Shillings.	Pound.
4	1		
48	12	1	
960	240	20	1

This and the following tables are to be under- ood thus: The words at the top are the names all the numbers below them; and all the num- rs upon the ſame line, from right to left, are equal value: thus in the laſt line of this table, o farthings, 240 pence, 20 ſhillings, and 1 pound e all equal to each other.

(58.) The full weight and value of our gold and ver coin is as below:

Coin.	Value. l	s	d	Weight. dwt.	gr.
[illegible]	1	1	0	5	9½
[illegible]	0	10	6	2	16½
[illegible]	0	5	3	1	8¼

SILVER.	Value. s	d	Weight. dwt.	gr.
A crown	5	0	19	3½
Half-crown	2	6	9	16¼
Shilling	1	0	3	21
Sixpence	0	6	1	22½

The value of gold is nearly 4l. an ounce, or 2d. a grain; and ſilver is nearly 5s. an ounce. Alſo any quantity of gold is to the ſame weight of ſtandard ſilver, in the proportion of 15 and 1-14th to 1, or nearly 15 to 1.

(59.) OF TROY WEIGHT.

Grains.	Pennyweights.	Ounces.	Pound.
24	1		
480	20	1	
5760	240	12	1

By this weight are weighed jewels, gold, ſilver, corn, bread, and liquors. One grain of Troy weight is equal to one grain and a half of ſound dry wheat.

(60.) OF APOTHECARIES WEIGHT.

Grains.	Scruples.	Drams.	Ounces.	Pound.
20	1			
60	3	1		
480	24	8	1	
5760	288	96	12	1

This weight is ſo called, becauſe the apothecaries uſe it in compounding their medicines; but they buy and ſell their drugs by avoirdupoiſe weight. Apothecaries is the ſame as troy weight, having only ſome different diviſions.

(61.) OF AVOIRDUPOISE WEIGHT.

Drams.	Ounces.	Pounds.	Quarters.	Hundrs.	Ton.
16	1				
256	16	1			
7168	448	28	1		
28672	1792	112	4	1	
573440	35840	2240	80	20	1

By this weight are weighed all things of a coarſe or droſſy nature; ſuch as grocery and chandlers wares, and all metals except gold and ſilver.

	oz.	dwt.	gr.	
1 lb. Avoirdupoiſe makes	14	11	15½	Troy.
1 oz.	0	18	5½	
1 dr.	0	1	3½	

(62.) OF LONG MEASURE.

Inches.	Feet.	Yards.	Poles.	Furlongs.	Mile.
12	1				
36	3	1			
198	16½	5½	1		
7920	660	220	40	1	
63360	5280	1760	320	8	1

An inch is ſuppoſed equal to 3 barley corns in length.

4 inch.—a hand.
6 feet, or 2 yards—a fathom.
3 miles—a league.
60 nautical or geographical miles—a degree, or

69¼ ſtatute miles nearly.
360 degrees, or 25000 miles nearly, are the circumference of the earth.

(63.) OF CLOTH MEASURE.

Inches.	Nails.	Quarters.	Yard.
2¼	1		
9	4	1	
36	16	4	1

3 qrs. = 1 ell Flemiſh.
5 — = — Engliſh.
6 — = — French.
4 qrs. 1¼ inch Scotch.

(64.) OF SQUARE OR LAND MEASURE.

Sqr. inch.	Sqr. feet.	Sqr. yds.	Sqr. poles.	Roods.	Acre.
144	1				
1296	9	1			
39204	272¼	30¼	1		
1568160	10890	1210	40	1	
6272640	43560	4840	160	4	1

OF SCOTS LAND MEASURE.

Square ells.	Falls.	Roods.	Acre.
36	1		
1440	40	1	
5760	160	4	1

(65.) OF WINE MEASURE.

Pints.	Gallons.	Tierces.	Hhds.	Puncheons.	Pipes or Butts.	Ton.
8	1					
336	42	1				
504	63	1½	1			
672	84	2	1⅓	1		
1008	126	3	2	1½	1	
2016	252	6	4	3	2	1

231 cubic inch.—a gallon.
10 gall.—an anker.
18 gall.—a rundlet.
31½ gall.—a barrel.

By this meaſure, wines, brandies, ſpirits, perry, cyder, mead, vinegar, oil, and honey are meaſured.

(66.) OF ALE AND BEER MEASURE.

Pints.	Galls.	Firk.	Kilderk.	Bar.	Hhd.
8	1				
68	8½	1			
136	17	2	1		
272	34	4	2	1	
408	51	6	3	1½	1

The ale gallon contains 282 cubic inches.

In London, the ale firkin contains 8 gallons, and the beer firkin 9: the other meaſures above it being decreaſed and increaſed in the ſame proportion.

(67.) OF DRY MEASURE.

Pints.	Galls.	Pecks.	Buſh.	Combs	Quar.	Weys.	Laſt.
8	1						
16	2	1					
64	8	4	1				
256	32	16	4	1			
512	64	32	8	2	1		
2560	320	150	40	10	5	1	
5120	640	320	80	20	10	2	1

The gallon dry meaſure, contains 268⅘ cubic inches. At London 36 buſhels of coals, make a chaldron. A buſhel water meaſure is 5 pecks.

By dry meaſure all dry wares, ſuch as corn, ſeeds, fruits, roots, ſand, ſalt, coals, oyſters, muſcles, cockles, &c. are meaſured.

OF SCOTS DRY MEASURE.

Lippies.	Pecks.	Firlots.	Bolls.	Chaldrons.
4	1			
16	4	1		
64	26	4	1	
1024	256	64	16	1

(68.) *Of* TIME.

Minutes.	Hours.	Days.	Weeks.	Months.
60	1			
1440	24	1		
10080	168	7	1	
40320	672	28	4	1

The minute is divided into 60 ſeconds, and a ſecond may be ſuppoſed to be divided into 60 thirds, &c.

(69.) EXAMPLE I. *Of* REDUCTION DESCENDING.

How many minutes is 29 days 12 hours 45 minutes, or a lunar month?

29 ds. 12 hs. 45 ms.
24
128
58
708
60
42525

(70.) EXAMPLE II. *Of* REDUCTION ASCENDING.

How many pounds, &c. in 35682 pence?

12)35682
20)29738. 6d.
1481. 13s. 6d.

PART II.

COMPOUND ARITHMETIC.

SECT. I. COMPOUND ADDITION.

(71.) Compound addition is the finding the ſum of ſeveral compound numbers.

(72.) RULE 1. Place the numbers of the ſame denomination under each other according to the directions given in ſimple addition.

2. Add up the figures in the loweſt denomination as in ſimple addition.

3. Find how many units of the next higher denomination are contained in the ſum, by dividing it by ſo many as of this name make one of the next.

4. Write the remainder or overplus underneath, and carry the ones or units to the figures in the next denomination, whoſe ſum you muſt find and proceed with as before; and ſo on, through all the

the denominations to the higheſt, whoſe ſum muſt be all written down, which together with the ſeveral remainders, will expreſs the total required.

(73.) EXAMPLES.

Money.			*Troy Weight.*		
£.	*s.*	*d.*	*lb.*	*oz.*	*dwt.*
13	12	4	17	3	15
17	10	3	2	5	7
6	4	1	18	1	17
3	9	2	23	10	12
40	15	10	61	9	11

SECT. II. COMPOUND SUBTRACTION.

(74.) Compound SUBTRACTION is the finding the difference between two numbers, of which one or both are compound.

(75.) RULE 1. Write the leſs number under the greater, as directed in compound addition.

2. Then, beginning at the leaſt denomination, ſubtract the under number of each from the upper, writing their reſpective remainders below them.

3. But if the under number of any of the denominations be greater than the upper, add ſo many to the upper as make one of the next higher denomination; then take the under from the ſum, writing down the remainder as before, and carry to add one to the under number of the next higher denomination before you ſubtract it.

(76.) EXAMPLES.

C	qr	lb	A	R	F	E
12	3	19	15	2	24	18
4	3	24	12	2	36	7
7	3	23	2	3	28	11

SECT. III. COMPOUND MULTIPLICATION.

(77.) Compound MULTIPLICATION is the finding of a number which ſhall contain a given compound number any propoſed number of times.

(78.) RULE 1. Write the multiplier under the leaſt denomination of the multiplicand.

2. Multiply the number of the loweſt denomination by the multiplier, and find how many units of the next higher denomination are contained in the product, as in compound addition.

3. Write down the exceſs, and carry the ones to the product of the next higher denomination, with which proceed as before; and in like manner with all the other denominations to the higheſt.

(79.) EXAMPLES.

£	*s*	*d*	*miles*	*fur.*	*poles.*
7	9	8¼	31	3	12
		7			11
52	7	9¼	345	4	12

See more on this ſubject under PRACTICE, SECT. VII. RULE 1.

SECT. IV. COMPOUND DIVISION.

(80.) Compound DIVISION is the dividing compound numbers into any propoſed number of equal parts.

(81.) RULE 1. Place the diviſor and dividend as in ſimple diviſion.

2. Begin at the higheſt denomination and divide each by the diviſor, writing the quotients under their reſpective dividends.

3. But if there be a remainder after dividing any of the denominations except the leaſt, find how many of the next lower denomination it is equal to, and add to it the ſmall number (if any) which was in this denomination before; then divide the ſum.

(82.) EXAMPLES.

£	*s*	*d*	*yds.*	*f.*	*in.*
3)1	8	6	12)150	1	7
	9	6		12	1 7½

See farther on this ſubject, under PRACTICE, SECT. VII. RULE 2.

SECT. V. PROPORTION *or the* RULE OF THREE.

(83.) The Rule of Three is that by which a number is found having the ſame proportion to a given number, which is between two other given numbers. It is called the Rule of Three, becauſe in each of its queſtions there are given three numbers at leaſt. And becauſe of its excellent and extenſive uſe, it is often named the GOLDEN RULE.

(84.) RULE, *for* STATING, *or* SETTING DOWN *the* THREE GIVEN NUMBERS.

1. Write down the number which is of the ſame kind with the anſwer or number required.

2. Conſider whether the anſwer ought to be greater or leſs than this number; then write reſpectively the greater or leſs of the two remaining numbers on the right of it for the third, and the other on the left for the firſt number or term.

3. Multiply the 2d and 3d terms together, divide the product by the firſt, and the quotient will be the anſwer.

(85.) OBSERVATIONS. 1. When you can conveniently multiply and divide as in compound multiplication and diviſion, it is beſt to do ſo.

2. If not, reduce the compound terms to be the loweſt name mentioned in them, and the firſt and third to the ſame name if they be not ſo already; then the anſwer will be of the ſame name with the 2d term.

3. When there happens to be a remainder after diviſion, reduce it to the name next below the laſt quotient, and divide by the ſame diviſor, ſo ſhall the quotient be ſo many of the ſaid next name; do this as long as there is any remainder, till you have reduced it to the leaſt name, and all the quotients together will be the anſwer.

4. If the 1ſt term, and either the 2d or 3d can be divided by any number, without remainder, let them be divided, and the quotients uſed inſtead of them.

(86.) There are four other methods of operation beſides the above general one, any of which, when poſſible, performs the work much ſooner, viz.

1. Divide the 2d term by the 1ſt, multiply the quotient by the 3d, and the product will be the anſwer.

2. Divide the 3d term by the 1ſt, multiply the quotient by the 2d, and the product will be the anſwer.

3. Divide the 1ſt term by the 2d, divide the 3d by

by the quotient, and the laſt quotient will be the anſwer.

4. Divide the 1ſt term by the 3d, divide the 2d by the quotient, and the laſt quotient will be the anſwer.

(87.) EXAMPLE I. To find the value of 14 oz. 8 dwt. of gold, at 3l. 19s. 11d. an ounce.

(88.) EXPLANATION. Having ſtated the three terms by the general rule, as here annexed, the 2d term is reduced to pence, and the 3d to dwts. theſe being their loweſt denominations, as above directed. The 1ſt term is alſo reduced to dwts. that it may agree with the 3d. The 2d term is then multiplied by the 3d, and the product divided by the 1ſt, according to the general rule, when the anſwer comes out 13809 pence, and 12 remaining over; which remainder being reduced to farthings, and theſe divided by the ſame diviſor 20, the quotient is 2 farthings, and 8 remaining. Laſtly, the pence are divided by 12 to reduce them to ſhillings, and theſe again by 20 for pounds; when the final ſum comes out 57l. 10s. 9d. 2q. for the anſwer.

oz	l	s	d		oz	dwt
1 :	3	19	11	: :	14	8 :
20	20				20	
20	79				288	
	12					
	959					
	288					
	7672					
	7672					
	1918					

2,0)27619,2
13809,$\frac{12}{20}$ pence, or
12)13809d $2\frac{8}{20}$ qr.
2,0)1150s. 9d. $2\frac{8}{20}$q.
Anſ. 57l. 10s. 9d. $2\frac{8}{20}$q.

(89.) EXAMPLE II. How many men muſt be employed to finiſh a piece of work in 15 days, which 5 men can do in 24 days?

d	m	d
15 :	5	: : 24
		5

15)120(8 men. Anſwer.
120

SECT. VI. COMPOUND PROPORTION, *or the* RULE OF FIVE.

(90.) This rule is ſo called, becauſe that in it there are five numbers or terms given, to find a ſixth.—It is often named the *double rule of three*, becauſe its queſtions are ſometimes performed by two operations of the rule of three. Of the five given numbers, three contain a ſuppoſition, and the other two a demand; one of the terms of ſuppoſition being of the ſame kind with the number required, and the other two of the ſame kind as the demanding terms.

(91.) RULE *for* STATING *the* FIVE *given* NUMBERS.

1. Write down the term of ſuppoſition which is of the ſame kind with the anſwer, for the middle term.

2. Take one of the other two terms of ſuppoſition, and of the demanding terms, both of a kind; and from the direction given in the RULE OF THREE, conſider which places they would poſſeſs if a ſtating were made of them and the middle term only, and place them accordingly; do the ſame with the other term of ſuppoſition and its correſpondent demanding one, writing the terms under each other which fall on the right and left of the middle term.

(92.) METHODS *of* OPERATION.

1. BY TWO OPERATIONS. Take the two upper terms and the middle term, in the ſame order as they ſtand, for the firſt ſtating of the rule of three; then take the fourth number reſulting from the firſt ſtating, for the middle term, and the two under terms in the general ſtating, in the ſame order as they ſtand, for the extreme terms of the ſecond ſtating; and the fourth term reſulting from it will be the anſwer.

2. BY ONE OPERATION. Multiply together the terms of which the one is above the other, or beſides of the middle term; then account the two products and the middle term, as they ſtand, the three terms of a rule of three ſtating, and the fourth term thence reſulting will be the anſwer. It is generally beſt to work by the latter method, viz. by one operation. And after the ſtating, and before commencing the operation, if one of the two firſt terms, and either the middle term or one of the two laſt terms will exactly divide by one and the ſame number, let them be divided, and the quotients uſed inſtead of them; which will much ſhorten the work.

(93.) EXAMPLE.

If 100 men make 3 miles of road in 27 days; how many days will 150 men make 5 miles?

men	d	men
150 :	27	: : 100
miles 3		5 miles
450		500
		27

450)13500(30 days. Anſ.

The ſame queſtion by two operations.

men	d	men	miles	d	miles
150 :	27	: : 100	3 :	18	: : 5
100				5	
150)2700(18 days			3)90(30 days. &c.		

SECT. VII. RULES *of* PRACTICE.

(94.) By RULES OF PRACTICE are meant certain expeditious methods of caſting up accounts, and they conſiſt of the moſt general contractions of the rule of three when either the firſt or third term is 1.

(95.) RULE I. *To find the* PRICE *of any* INTEGER NUMBER *of things.* When the number is not very great, multiply the price of 1 integer, by the given number whoſe price is

found, as in compound multiplication, and the product will be the price required.

(96.) If the multiplier exceed 12, it is commonly beſt to multiply ſucceſſively by its component parts, as in ſimple multiplication. But if the multiplier cannot be exactly produced by the multiplication of ſmall numbers, find the neareſt to it, either greater or leſs, which can be ſo produced; then after having multiplied continually by the component parts of this number, to or from the laſt product, add or ſubtract the product of ſo many as it is leſs or greater than the given number.

(97.) EXAMPLE.

What is the value of 38 cwt. at 1l 11s 4d per cwt?

£	s	d	
1	11	4	
		3	
4	14	0	
		12	
56	8	0	value of 36 cwt.
3	2	8	—— of 2 ——
Anſ. 59	10	8	—— of 38 cwt.

(98.) When the number is very large, as many hundreds or thouſands; multiply the price of 1 continually by 10 till it come to the higheſt denomination, namely twice by 10 for hundreds, thrice by 10 for thouſands, &c. then multiply theſe ſeveral products, by their reſpective local digits in the given number, which laſt products place orderly under each other, and add them together for the anſwer.

(99.) EXAMPLE.

To find the price of 7985 at 7s 10½d.

£	s	d	
0	7	10½	× 5
		10	
3	18	11½	× 8
		10	
39	9	7	× 9
		10	
394	15	10	× 7
		7	
2763	10	10	----- 7000
355	6	3	----- 900
31	11	8	------ 80
1	19	5½	------ 5
Anſ. 3142	8	2½	---- 7985

(100.) RULE II. *When the* PRICE *of ſome* CERTAIN NUMBER *is given, to find the* PRICE *of the* INTEGER, *or* 1. Divide the given price by its number, as in compound diviſion, and the quotient will be the price of 1 as required. When the number or diviſor exceeds 12, it is beſt to divide ſucceſſively by its component parts, as in ſimple diviſion. But if the diviſor cannot be produced by the multiplication of ſmall numbers, divide by it after the manner of long diviſion.

(101.) EXAMPLE.

If 22 cwt. coſt 24l 4s, what is 1?

£	s	
2)24	4	
11)12	2	price of 11 cwt.
1	2	—— of 1 ——

The rent of 172 Acres is 197l 16s, what is the rent of 1 Acre?

£	s	£	s	
172)197	16(	1	3	per Acre
	25			
	20			
	516			
	516			

(102.) RULE III. *If the* GIVEN PRICE *of 1 or the* INTEGER *be an* ALIQUOT PART *of a* PENNY, SHILLING, *or* POUND, take the ſame part of the given quantity (whoſe price is to be found by dividing it by the number of times which the given price of 1 is contained in a penny, ſhilling, or pound) for the anſwer in pence, ſhillings, or pounds reſpectively.

(103.) EXAMPLE.

23984 at 4d or ⅓ of 1s.

3)23984
20)7994s 8d
399l 14s 8d Anſwer.

(104.) RULE IV. *If the* GIVEN PRICE *be no* ALIQUOT PART *of a penny, ſhilling, or pound,* divide it into ſeveral aliquot parts, then work for each by rule 3, and their ſum will be the anſwer. Or, it may often be divided ſo, that the leſs will be aliquot parts of the greater; then take the ſame parts of the prices found for the greater.

(105.) EXAMPLE.

3274 at 13s 9d.

				3274		
at 10s.		or ½ l. is		1637		
— 3 4d		or ⅙ l. is		545	13	4
— 5	or ½ of 3 4d. is			68	4	2
at 13 9			is £.	2250	17	6

(106.) RULE V. *If there be* POUNDS *in the* PRICE, multiply the given quantity by the number of them: *and if there be alſo ſome* ODD MONEY, find its produce by the former rules, and add them together.

(107.) EXAMPLE.

2596 at L. 3 5s.

2596
3

at L. 3 is 7788
— 5s is 649

L. 8437 Anſwer.

(108.) RULE VI. *When there is ſome* ODD WEIGHT, *or* MEASURE, *in the quantity:* after having multiplied the price by the number of integers, (if there be any) divide the odd quantity into aliquot parts of the integer, or of the price of each other, and add them all together.

(109.) EXAMPLE.

3 ton 5 cwt. 2 qr. at L. 7 : 9 : 3, per ton.

	L.		
	7	9	3
			3
	22	7	9
5 cwt. is $\frac{1}{4}$ of a ton,	1	17	$3\frac{1}{2}$
2 qr. is $\frac{1}{10}$ of 5 cwt.		3	$8\frac{1}{4}$
	24	8	$9\frac{1}{2}$ Anſwer.

(110.) RULE VII. *If there be a* FRACTION *in the* GIVEN QUANTITY; after having worked for the integral part, by any of the former rules, find the produce of the fraction, by multiplying the price by the numerator, and dividing the product by the denominator, then add them together for the anſwer.

(111.) EXAMPLE.

1735$\frac{1}{4}$ at L. 1 5s.

L. 1 5
3
8)3 15(- - - - - - -

4)1735
433 15
9 $4\frac{1}{2}$

Anſwer L. 2169 4 $4\frac{1}{2}$

SECT. VIII. TARE *and* TRET.

(112.) GROSS WEIGHT of any commodity is its own weight together with that of its package, whether it be caſk, cheſt, or any thing elſe.

(113.) TARE is the weight of the package, or an allowance made inſtead of it. What remains after the tare is taken from the groſs, may be called tare ſuttle, if there be more deductions.

(114.) TRET is an allowance of 4 lb. upon every 104lb. of tare ſuttle, on account of duſt or other waſte. What remains after tret is deducted, may be called tret ſuttle, if there be any following deduction.

(115.) CLOFF is an allowance of 2 lb. for every 3 cwt. and ſome ſay, for every 100 lb. of tret ſuttle, to make the weight hold good, when ſold by retail.

(116.) When all the deductions are made, the laſt remainder is called NEAT or NET WEIGHT. When the tare is at ſo much per cwt. it will be beſt to divide it into aliquot parts of it, as in the Rule of Practice. The tret being 4 to 104, or 1 to 26, will be found by taking the 26th part of the tare ſuttle. In calculating oil and ſpirits, 7 lb. neat are allowed to the gallon.

(117.) EXAMPLE.

Groſs 17 cwt. 3 qr. 14 lb. tare 12 lb. per cwt. tret 4 to 104, and cloff 2 to 100 or 1 to 50. How much neat?

	lb.	cwt.	qr.	lb.	
		17	3	14	groſs
	8 = $\frac{1}{14}$	1	1	3	
	4 = $\frac{1}{2}$	0	2	$15\frac{1}{2}$	
		1	3	$18\frac{1}{2}$	tare
	26	15	3	$23\frac{1}{2}$	tare ſuttle
		0	2	$12\frac{1}{2}$	tret
	50	15	1	$10\frac{1}{2}$	tret ſuttle
		0	1	$6\frac{1}{4}$	cloff
		15	0	$4\frac{1}{4}$	neat

PART III.

VULGAR FRACTIONS.

SECT. I. DEFINITIONS.

(118.) A FRACTION, or broken number, is an expreſſion of one or more parts of any number.

(119.) The number of parts into which the number is ſuppoſed to be divided, is called the DENOMINATOR; and the number of thoſe parts expreſſed by the fraction, is called the NUMERATOR. Theſe two numbers are in general named the TERMS of the fraction.

(120.) If the number of which the fraction is a part, or parts, be 1, it is called a SIMPLE FRACTION; and is denoted by the numerator written above the denominator, with a ſmall line between them: So, $\frac{1}{3}$ denotes one third of 1; $\frac{7}{8}$ denotes ſeven eighths of 1.

(121.) But if the number be different from 1, it is called a COMPOUND, and is denoted by the word *of*, and the number ſubjoined to the numerator and denominator, expreſſed as before. So, $\frac{1}{2}$ of 6, denotes one half of 6; $\frac{2}{3}$ of 8, denotes two thirds of 8; and $\frac{3}{4}$ of $\frac{5}{8}$, denotes three fourths of five eighths of 1.

(122.) Simple fractions, whoſe numerators are leſs than their denominators, are called PROPER FRACTIONS. And thoſe whoſe numerators are equal to, or greater than, their denominators, are called IMPROPER FRACTIONS.

(123.) The expreſſion formed from an integer and a fraction joined together, is called a MIXT NUMBER. If both the numerator and denominator of a fraction be multiplied or divided by the ſame number, the fraction will retain its original value. All computations in fractions are founded on this principle.

(124.) The following SIGNS, being frequently uſed to avoid circumlocution, require to be here explained.

=	signifies	equality,	and denotes that	the ſums are equal,	Thus, 4 and 4 = 8
+		addition,		the numbers are added,	8 + 2 = 10
−		ſubtraction,		the leſs N. is deducted,	8 − 2 = 6
×		multiplication,		the ſums are multiplied,	8 × 2 = 16
÷		diviſion,		the higher N. is divided,	8 ÷ 2 = 4

SECT. II. REDUCTION *of* VULGAR FRACTIONS.

(125.) RULE I. *To* ABBREVIATE *or* REDUCE FRACTIONS *to* LESS TERMS. Divide the terms of the given fraction by any number which will divide them without a remainder; the quotients will be the terms of a new fraction, equal in value to the former: This may be abbreviated again, and the next again, and ſo on, till it appear that there is no number greater than 1 that will divide them, in which caſe, the fraction is ſaid to be in its LEAST terms.

(126.) EXAMPLE.

Let $\frac{42}{72}$ be propoſed to be abbreviated.

$\frac{42}{72}=\frac{21}{36}=\frac{7}{12}$, by dividing firſt by 2 and then by 3.

(127.) If the numerator and denominator, inſtead of being expreſſed by ſingle numbers, are expreſſed by the continual product of ſeveral, ſuch numbers as are both in the numerator and the denominator may be left out without changing the value of the fraction:

Thus $\frac{7\times3\times8\times10}{7\times8\times11}=\frac{3\times10}{11}=\frac{30}{11}$

(128.) If the fraction muſt be brought to its leaſt terms at one diviſion, divide its terms by their greateſt common meaſure, which common meaſure is found by dividing the greater term by the leſs, and this diviſor by the remainder; and ſo on, always dividing the laſt diviſor by the laſt remainder, till o remain; then is the laſt diviſor the greateſt common meaſure required.

(129.) EXAMPLE. Reduce $\frac{246}{372}$ to its leaſt terms at one diviſion.

Firſt, 246)372(1
126)246(1
120)126(1
The common meaſure 6)120(20

Then $\frac{246\div6}{372\div6}=\frac{41}{62}$

(130.) RULE II. *To* REDUCE *an* IMPROPER FRACTION *to its* EQUIVALENT WHOLE *or* MIXT NUMBER. Divide the numerator by the denominator, and the quotient will be the integer or mixed number required.

(131.) EXAMPLES.

$\frac{12}{3}=4.$ $\frac{37}{11}=3\frac{4}{11}$ $\frac{15}{7}=2\frac{1}{7}$

(132.) RULE III. *To* REDUCE *an* INTEGER *to an* EQUIVALENT FRACTION *of a* GIVEN DENOMINATOR. Multiply the integer by the given denominator, and the product will be the numerator required.

(133.) EXAMPLE. Reduce 7 to a fraction whoſe denominator ſhall be 4.

$7=\frac{7\times4}{4}=\frac{28}{4}.$

(134.) RULE IV. *To* REDUCE *a* MIXT NUMBER *to an* EQUIVALENT IMPROPER FRACTION. Multiply the integer by the denominator of the fraction, to the product add the numerator; then the ſum written above the denominator will form the fraction required.

(135.) EXAMPLE.—Reduce $2\frac{3}{7}$ to a fraction.

$2\frac{3}{7}=\frac{2\times7+3}{7}=\frac{14+3}{7}=\frac{17}{7}$

(136.) RULE V. *To* REDUCE *a* COMPOUND FRACTION *to an* EQUIVALENT SIMPLE ONE. Multiply all the numerators together for the numerator, and all the denominators together for the denominator of the ſimple fraction required. If part of the compound fraction be an integer or a mixt number, reduce it to a fraction by one of the former caſes.

(137.) EXAMPLE.—Reduce $\frac{1}{2}$ of $\frac{2}{3}$ of $\frac{3}{4}$ of 5 to a ſimple fraction.

$\frac{1}{2}$ of $\frac{2}{3}$ of $\frac{3}{4}$ of $\frac{5}{1}=\frac{1\times2\times3\times5}{2\times3\times4\times1}=$ (by omitting the common terms, 1, 2, and 3) $\frac{5}{4}$

(138.) RULE VI. *To* REDUCE FRACTIONS *of* DIFFERENT DENOMINATORS *to* EQUIVALENT FRACTIONS *of a* COMMON ONE. If the fractions can be conveniently reduced to a common denominator, by applying or dividing their terms, proceed by that method. But, if not, multiply each numerator continually into all the denominators, except its own, for each new numerator; and multiply all the denominators together for the common denominator. In this and ſeveral other operations, when any of the propoſed quantities are integers, mixt numbers or compound fractions, they muſt be reduced by their proper rules, to the form of ſimple fractions.

(139.) EXAMPLE.—Reduce $\frac{1}{2}$, $\frac{2}{3}$, and $\frac{3}{4}$ to a common denominator.

Thus $\frac{1}{2}$, $\frac{2}{3}$, and $\frac{3}{4}=\frac{12}{24}$, $\frac{16}{24}$ and $\frac{18}{24}$
or $=\frac{6}{12}$, $\frac{8}{12}$, and $\frac{9}{12}$

(140.) RULE VII. *To* FIND *the* VALUE *of* PROPER FRACTIONS *in numbers of* INFERIOR DENOMINA-

MINATIONS. Multiply the numerator by the integer, and divide by the denominator.

(141.) EXAMPLES.

1. What is the $\frac{4}{5}$ of 2l. 6s.

2l. 6s.
4
5)9 4
Anf. 1l. 16s. 9d. $2\frac{2}{5}$q.

2. Required the value of $\frac{1}{3}$ of 2l.

20
3)40(13s. 4d. Anf.
1
12
12(4d.

(142.) RULE VIII. *To* REDUCE FRACTIONS *to other* EQUIVALENT ONES *of a* DIFFERENT INTEGER; *a certain number of the* LESS INTEGER *being* CONTAINED *in* ONE OF THE GREATER. Conſider how many of the leſs integer make one of the greater; and by that number multiply the numerator if the reduction be to a leſs integer, or the denominator, if to a greater.

(143.) EXAMPLES.

Reduce $\frac{2}{9}$l. to the fraction of a ſhilling.

$$\frac{2}{9}\text{l.} = \frac{2\times 20}{9} = \frac{40}{9}\text{s.}$$

Reduce $\frac{40}{9}$s. to the fraction of 1l.

$$\frac{40}{9}\text{s.} = \frac{40}{9\times 20}\text{l.} = \frac{2}{9}\text{l.}$$

If a compound whole number be propoſed, reduce it all to the loweſt denomination mentioned in it, and proceed as before.

(144.) RULE IX. *To* REDUCE FRACTIONS *to* EQUIVALENT ONES *of a* DIFFERENT INTEGER, when a certain number of the LESS IS NOT EXACTLY *contained in the* GREATER. 1. By the laſt, reduce the given fraction to an equivalent one of ſuch an integer, of which a certain number are contained in the integer to which the fraction muſt be brought, or which ſhall contain a certain number of this. 2. By the laſt alſo, reduce this fraction to an equivalent one of the integer required.

(145.) EXAMPLE.

Reduce $\frac{2}{7}$ of 1l. to the fraction of a guinea.

$$\frac{2}{7}\text{l.} = \frac{2\times 20}{7}\text{s.} = \frac{2\times 20}{7\times 21}\text{gui.} = \frac{40}{147}\text{guinea.}$$

SECT. III. ADDITION OF VULGAR FRACTIONS.

(146.) RULE. Reduce compound fractions to ſimple ones, and all to the ſame integer and denominator if they be different; then add all the numerators together, and ſet the ſum over the common denominator, for the ſum of the fractions required. When ſeveral fractions are to be collected, it is commonly beſt firſt to add thoſe two together which moſt eaſily reduce to a common denominator, then their ſum and a third, and ſo on.

(147.) EXAMPLE. What is the ſum of $\frac{1}{2}$, $\frac{2}{3}$ and $\frac{1}{4}$ of $\frac{3}{4}$.

$\frac{2}{3} + 7\frac{1}{2} + \frac{1}{4}$ of $\frac{3}{4} = \frac{2}{3} + 7\frac{1}{2} + \frac{3}{16} = \frac{1}{2} + 7\frac{11}{16} = 7\frac{19}{16} = 8\frac{3}{16}$ the ſum.

SECT. IV. SUBTRACTION OF VULGAR FRACTIONS.

(148.) RULE. The ſame preparations to be made here as in addition, take the difference of the numerators and ſet it over the common denominator, for the difference of the fractions required. In ſubtracting mixt numbers, when the fraction in the ſubtrahend is greater than that in the minuend, ſubtract the numerator of the ſubtrahend from the denominator, and to the difference add the numerator of the minuend; and carry one to the integer in the ſubtrahend.

(149.) EXAMPLES.

1. What is the difference between $\frac{15}{22}$ and $\frac{11}{17}$?

$$\frac{15}{22} - \frac{11}{17} = \frac{255-242}{17\times 22} = \frac{13}{374}\text{ Anſ.}$$

2. What is the difference between $5\frac{1}{8}$ and $2\frac{17}{19}$?

$5\frac{1}{8} - 2\frac{17}{19} = 5\frac{19}{152} - 2\frac{136}{152} = 4\frac{171}{152} - 2\frac{136}{152} = 2\frac{35}{152}$

SECT. V. MULTIPLICATION OF VULGAR FRACTIONS.

(150.) RULE. Reduce mixt numbers, if there be any, to fractions; then multiply all the numerators together for the numerator, and multiply all the denominators together for the denominator of the product required. A fraction is best multiplied by an integer, by dividing the denominator by it if poſſible, but if that cannot be done, multiply the numerator by it.

(151.) EXAMPLE.

What is the product of $\frac{2}{3}$, $3\frac{1}{4}$, 5, and $\frac{3}{4}$ of $\frac{3}{5}$?

$$\frac{2}{3}\times 3\tfrac{1}{4}\times 5\times\frac{3}{4}\text{ of }\frac{3}{5} = \frac{2\times 13\times 5\times 3\times 3}{3\times 4\times 4\times 5} = \frac{78}{80} = 4\tfrac{38}{80}.\text{ Anſ.}$$

SECT. VI. DIVISION OF VULGAR FRACTIONS.

(152.) RULE.—Having prepared the terms in multiplication; take the quotient of the numerators and of the denominators if they will exactly divide, for the numerator and denominator of the fraction required; but if that cannot be done, multiply the dividend by the RECIPROCAL of the diviſor, for the quotient required. By the reciprocal of a fraction, is meant the fraction got by inverting its terms: ſo the reciprocal of $\frac{2}{3}$ is $\frac{3}{2}$, and of 5 or $\frac{5}{1}$ is $\frac{1}{5}$. A fraction is divided by an integer by dividing the numerator by it, if poſſible; but if it will not exactly divide, then multiply the denominator by it.

(153.) EXAMPLES.

1. What is the quotient of $\frac{25}{9}$ by $\frac{5}{3}$?

$$\frac{25}{9} \div \frac{5}{3} = \frac{25\div 5}{9\div 3} = \frac{5}{3} = 1\tfrac{2}{3}.\text{ Anſ.}$$

2. What is the quotient of $\frac{5}{9}$ by $\frac{2}{15}$?

$$\frac{5}{9} \div \frac{2}{15} = \frac{5}{9} \times \frac{15}{2} = \frac{5 \times 15}{9 \times 2} = \frac{25}{6} = 4\frac{1}{6}. \text{ Anſ.}$$

PART IV.

DECIMAL FRACTIONS.

SECT. I. DEFINITION, NOTATION, AND NUMERATION OF DECIMALS.

(154.) A decimal is a fraction whoſe denominator is 1 with a cypher or number of cyphers annexed; being always one or more 10th parts, 100dth parts, 1000dth parts, 10,000dth parts, or the like.

(155.) The arithmetic of vulgar fractions is tedious, and even intricate to beginners. The difficulty ariſes chiefly from the variety of denominators; for when numbers are divided into different kinds of parts, they cannot be eaſily compared. This conſideration gave riſe to the invention of decimal fractions, where all the units are divided into ſimilar parts, and the diviſions and ſubdiviſions are regulated by the ſame ſcale which is uſed in the Arithmetic of Integers. The firſt figure of a decimal fraction ſignifies tenth parts, the 2d hundredth parts, the 3d thouſandth parts, and ſo on.

(156.) Decimals are written down without their denominators, the numerators being ſo diſtinguiſhed as to evince what the denominators are; which is done by ſeparating, by a point, ſo many of the right hand figures from the reſt as there are cyphers in the denominator; the figures on the left ſide of the point being integers, and thoſe on the right decimals. Thus $1\frac{3}{10}$ is written 1·3, and named 1 and 3 tenths; and $\frac{25}{100}$ is written ·25, and named 25 hundredths or hundredth parts. But if there be not a ſufficient number of figures in the numerator, cyphers are prefixed to ſupply the defect: So $\frac{1}{100}$ is written .01, that is 1 hundredth; and $\frac{15}{1000}$ thus .015, that is 15 thouſandths.

(157.) The uſe of cyphers in decimals, as well as integers, is to bring the ſignificant figures to their proper places, on which their value depends. As cyphers, when placed on the left hand of an integer, have no ſignification, but when placed on the right hand, increaſe the value ten times each; ſo cyphers, when placed on the right hand of a decimal, have no ſignification; but when placed on the left hand diminiſh the value ten times each.

(158.) The notation and numeration of decimals will be ſtill more obvious from the following examples:

4·7	ſignifies	Four and ſeven tenth parts.
·47		Four tenth parts, and ſeven hundredth parts, or 47 hundredth parts.
·047		Four hundredth parts, and ſeven thouſandth parts, or 47 thouſandth parts.
·407		Four tenth parts, and ſeven thouſandth parts, or 407 thouſandth parts.
4·07		Four, and ſeven hundredth parts.
4·007		Four, and ſeven thouſandth parts.

The column next the decimal point is ſometimes called *decimal primes*, the next *decimal ſeconds*; and the next decimal *thirds*, and ſo on.

SECT. II. ADDITION *and* SUBTRACTION *of* DECIMALS.

(159.) Write the propoſed numbers under each other, according to the value of their places, as in whole numbers; in which order, the decimal points will ſtand directly below each other: then add or ſubtract as in whole numbers, placing a decimal point in the ſum or difference, ſtraight below the other points.

(160.) EXAMPLES.

169·3	
27·48	
213·97	from 321·9
·04	ſub. 26·481
Sum 410·79	295·419

SECT. III. MULTIPLICATION *of* DECIMALS.

(161.) Write down the factors, and multiply exactly as in integers, placing the decimal point to the product, ſo as to make juſt as many decimals in it, as there are in both factors; and if there be not as many figures in the product, as there ought to be decimals, prefix cyphers to ſupply the deficiency.

(162.) EXAMPLES.

52·3	5·12
2·41	·0098
523	4096
2092	4608
1046	
126043	·050176

(163.) CONTRACTIONS.

When decimals are to be multiplied by 1, with any number of cyphers, it is done by only removing the decimal point ſo many places farther to the right hand, as there are cyphers in the multiplier, and ſubjoining cyphers, if need be.

EXAMPLE.

The product of 51·3 and 1000 is 51300·0.

(164.) When the product will contain many more decimals than are neceſſary for the preſent purpoſe, the work may be contracted thus.—Write the units figure of the multiplier ſtraight under ſuch decimal place of the multiplicand, as the laſt of the product is intended to be, writing the other figures of the multiplier in an inverted order; then, in multiplying, reject all the figures in the multiplicand, which are on the right of the multiplying figures; writing the products down ſo, that their right hand figures fall ſtraight below each other; and carrying to ſuch right hand figures from the product of the two preceding figures in the multiplicand thus, viz. 1 from 5 to 15, 2 from 15 to 25, 3 from 25 to 35, &c. and the ſum of the lines will be the product to the number of decimals required, and will be ſeldo wrong in the laſt figure.

EXAMPLE.

EXAMPLE.

Multiply 27·14986 by 92·41035, so as to retain only four places of decimals in the product.

Contracted.	*Common way.*
27·14986	27·14986
53014·29	92·41035
24434874	13 574930
542997	81 44958
108599	2714 986
2715	108599 44
81	542997 2
14	24434874
2508·9280	2508·9280 650510

SECT. IV. DIVISION *of* DECIMALS.

(165.) Divide as in integers; and to know how many decimals must be in the quotient, observe the following rules:

(166.) RULE. The first figure of the quotient must possess the same place of decimals or integers, as doth that figure of the dividend which stands over the units place of the first product.

(167.) RULE II. The decimal places of the divisor and quotient together, must be equal in number to those of the dividend. Whence, if the number of decimals in the divisor be taken from the number in the dividend, the remainder will be the number in the quotient. If, in any case, there be a remainder, after all the dividend figures are used, the quotient may be continued to any number of decimals by subjoining a cypher continually to the last remainder. And whenever the number of figures in the quotient is less than the required number of decimals, prefix cyphers to supply the defect.

(168.) EXAMPLE.

52·3)73·743(1·41
·016)5·040(315.
23·5)·2430(·018

(169.) CONTRACTIONS.

When the number of figures in the divisor is great, the division at large will be very troublesome, but may be contracted thus: Having by the first general rule found what place of decimals or integers the first figure of the quotient will possess; consider how many figures of the quotient will serve the present purpose; then take the same number of the left hand figure of the divisor, and as many of the dividend figures as will contain them (less than 10 times); by these find the first figure of the quotient, and for each following figure, divide the last remainder by the divisor, wanting one figure to the right, more than before, but observing what must be carried to the first product, for such omitted figures, as in the second contraction of multiplication; and continue the operation till the divisor is exhausted. When there are not as many figures in the divisor as are required to be in the quotient, begin the division with all the figures as usual, and continue it till the number of figures in the divisor, and those remaining to be found in the quotient, be equal, after which, use the contraction.

(170.) EXAMPLE.

Divide 2508·92806 by 92·41035, so as to have four decimals in the quotient, in which case, the quotient will contain six figures.

Common way.

92·41035)2508·928,06(27·1498
66072106
13848610
46075750
91116100
79467850
5539570

Contracted.

92·41035)2508·928,06(27·1498
660721
13849
4608
912
80
6

SECT. V. REDUCTION *of* DECIMALS.

(171.) RULE I. *To reduce a* VULGAR FRACTION *to an* EQUIVALENT DECIMAL. Divide the numerator by the denominator, as in division of decimals, and the quotient will be the decimal required.

(172.) EXAMPLES.

$\frac{3}{8} = ·375$ $\frac{12}{75} = ·16$ $\frac{3}{67} = ·04477$

(173.) RULE II. *To* reduce *a* DECIMAL *of a* SUPERIOR DENOMINATION *to its* VALUE *in the* INFERIOR ONES. Multiply the given decimal by such a number as will reduce it to the next inferior name, and point off in the product as many places of decimals as are in the given number; then reduce these in the same manner to the next name, and so continue the reduction to the lowest name required, or till the decimals pointed off be all cyphers; then the numbers on the left of the points will express the value of the decimal.

(174.) EXAMPLE.

What is the value of ·775 of L. 1.

·775
20

sh. 15·500
12

d. 6·000

(175.) RULE III. *To* REDUCE INTEGERS *or* DECIMALS *to* EQUIVALENT DECIMALS *of* SUPERIOR DENOMINATIONS.

CASE I. If a simple number or decimal be proposed, reduce it to the name required, by dividing as in reduction of integers.

(176.)

(176.) EXAMPLE.

Reduce 9 d. to the decimal of a pound

12)9·00

20)·7500

·0375

(177.) CASE II. A COMPOUND NUMBER may be reduced to a ſuperior name, by reducing each of its parts, and taking the ſum of the decimals; the beſt way to do which is this: Write the given numbers under each other, proceeding orderly from the leaſt to the greateſt name, for dividends; draw a perpendicular line on the left of theſe, and on the left of it write oppoſite to each dividend ſuch a number, for a diviſor, as will reduce it to the next ſuperior name; then begin with the upper diviſion, and affix the quotient of each to the next divend, as a decimal part of it, before it be divided, and the laſt ſum will be the anſwer.

(178.) EXAMPLE.

Reduce L. 3 : 12 : 6¾d. to the denomination of pounds.

4	3
12	6·75
20	12·5625
	3·628125 Anſ.

PART V.

INTEREST.

SECT. I. DEFINITIONS.

(179.) INTEREST is the premium allowed for the loan of money.

(180.) The ſum lent is called the PRINCIPAL. The ſum of the principal and intereſt is called the AMOUNT.

(181.) Intereſt is allowed at ſo much *per cent.* or *per annum*, which premium *per cent. per annum*, or intereſt of L. 100 for a year, is called the RATE of intereſt.

(182.) Intereſt is of two ſorts, SIMPLE and COMPOUND.

SECT. II. SIMPLE INTEREST.

(183.) SIMPLE INTEREST is that which is allowed for the principal lent only.

(184.) RULE I. *To* FIND *the* INTEREST *for* A YEAR, multiply the principal by the rate, and diviſe the product by 100.

(185.) II. *To* FIND *the* INTEREST *for* SEVERAL YEARS, multiply the intereſt of one year by the number of them.

(186.) III. *To* FIND *the* INTEREST *for* ANY PARTS *of a* YEAR, *as* ½, ¼, *&c.* take the ſame proportional parts of one year's intereſt.

(187.) IV. *For* ANY NUMBER *of* DAYS, multiply the intereſt of a year by them, and divide by 365.

(188.) EXAMPLE.

What is the intereſt of L. 225, 10s. for 6¼ years, at 4½ *per cent. per annum?*

225·5 principal
4·5 rate

100)1014·75

10·1475 intereſt for a year
6

60 8850 intereſt for 6 years
2·536875 intereſt for ¼ year

63·421875
or L. 63 : 8 : 5¼ d. the intereſt required.

(189.) The above rules for ſimple intereſt ſerve alſo to calculate *Commiſſion, Brokage, Inſurance,* the *Stocks*, or any thing elſe rated at ſo much *per cent.*

SECT. III. COMPOUND INTEREST.

(190.) Compound INTEREST is that which is allowed, not only for the ſum lent, but alſo for its intereſt; as it becomes due at the end of each ſtated time of payment.

(191.) RULE. Find the amount of the given principal for the time of the firſt payment, by ſimple intereſt; then conſider this amount as the principal for the ſecond payment, whoſe amount calculate in the ſame manner; and ſo on through all the payments, ſtill accounting the laſt amount as the principal of the next payment.

(192.) EXAMPLE.

What will L. 50 amount to in 3 years, at 5 *per cent. per annum*, compound intereſt?

To 50 principal
add 2·5 intereſt for 1 year

52·5 principal for ſecond payment
2·625 intereſt

55·125 principal for third payment
2·75625 intereſt

57·88125 } amount required
or L. 57 : 17 : 7½ d. }

(193.) In calculating compound intereſt for *parts of times*, ſome authors, for expedition, calculate for a complete time, and then take a part of the reſult proportionate to the part of the time; but this is not juſt, as the compound intereſt does not increaſe in the early period exactly in proportion to its increaſe in the late or complete period. In all ſuch calculations therefore, where it is neceſſary to calculate compound intereſt, for parts of times, the moſt expeditious and accurate method is by LOGARITHMS; for though it is poſſible to make ſuch calculations without them, the trouble is immenſe; whereas, by logarithms it is as eaſy to perform the calculations with parts of times of payment, as with whole ones.

SECT. IV. DISCOUNT.

(194.) DISCOUNT or REBATE is the difference between a ſum of money due at a certain time to come, and its preſent worth. The PRESENT VALUE of any ſum or debt, due ſome time hence, is ſuch a ſum, as if put to intereſt, would in the time

time and at the rate for which the diſcount is to be made, amount to the ſum or debt then due.

(195.) Rule. As the amount of 100 l. for the given rate and time, is to the given ſum or debt, ſo is 100l, or the intereſt of 100 for the given time to the preſent worth, or to the diſcount of the given ſum, reſpectively.

(196.) The method uſed among bankers in diſcounting bills is to find the intereſt of the ſum drawn for from the time the bill is diſcounted, to the time when it becomes due, (including the days of grace) which intereſt they reckon as the diſcount, thereby making the diſcount more than really is. But when goods are bought or ſold, and diſcount is to be made for preſent payment, at any rate per cent. without regard to time, the intereſt of the ſum as calculated for a year is the diſcount.

(197.) Example. What is the preſent worth of 700 l, due 9 months hence, diſcount at 5 per cent. per annum?

100
3·75 int. for 9 months.

103·75 amount of L. 100

L. L. L.
103·75 : 700 : : 100
100

103·75)70000(674·6988
or L. 674. 13 s. 11 d.
preſent worth ſought.

Sect. V. Equation *of* Payments.

(198.) Equation of payments is the finding a time, when if a ſum of money be paid which is equal to the ſum of ſeveral others due at different times, no loſs will be ſuſtained by either party.

(199.) Rule. Multiply each payment by the time it is due at, then dividing the ſum of the products by the ſum of the payments, the quotient is the equated time.

(290.) Ex. A debt of L. 60. is to be paid, L 50, at 2 months, and L. 30. at 4 months: but if it be reduced to one payment, at what time muſt it be paid?

L.
2 × 30=60
4 × 30=120

60) 180 (3 months, the time required.
180

PART VI.

COMMERCIAL ARITHMETIC.

Introduction.

(201.) Although every branch of arithmetic might come under the title Commercial, as the whole ſcience is more or leſs applicable to commerce or mechanics, yet under this head we mean only to comprehend thoſe Rules of arithmetic (as they are commonly called) not yet taken notice of, which are generally inſerted in practical treatiſes on this ſcience; but which could not with propriety be introduced in the preceding parts, and which do not properly come under the article Algebra, Book-keeping, Geometry or Logarithms.

Sect. I. Single Fellowship.

(202.) Single Fellowſhip is a rule by which any ſum or quantity may be divided into any aſſigned number of parts, which ſhall be proportional to ſo many other propoſed numbers, each to each. By this rule are adjuſted the gain or loſs or charges of merchants in company, the effects of bankrupts, legacies in caſe of a deficiency of aſſets, &c.

(203.) Rule. Make the ſum of the numbers, to which the acquired parts muſt be proportional, the firſt term; the quantity to be parted or divided, the ſecond; and each of the given numbers, to which the required ones muſt be proportional, the ſeveral third terms, of ſo many rule of three queſtions; the fourth terms of which will be the reſpective parts required.

(204.) Ex. two merchants, A and B, trade together: A puts into the ſtock L. 60. and B puts in L. 40. They gain by trading L. 24. What are their ſhares of it?

60
40
—
100 : 24 { : : 60 : L. 14 8 A's ſhare.
{ : : 40 : 9 12 B's ſhare.

Proof, 24

Sect. II. Double Fellowship.

(205.) When the ſhares of the partners are continued in company unequal times, they occaſion the name *fellowſhip with time*, or *double fellowſhip*: which is performed by the following

(206.) Rule. Multiply each ſhare by the time of its continuance; than divide the gain or loſs in proportion to the products, as in ſingle fellowſhip, by ſaying, as the ſum of the products is to the whole gain or loſs, ſo is each product, to each part of it.

(207.) Ex. A had in company L. 50 for 4 months, B L. 60. for 5 months, at the end of which time, they gained L. 24. How muſt it be divided between them?

4 × 50= 200
5 × 60=300

600 : 24 { : : 200 : L. 8 9 12 A's ſhare.
{ : : 300 : 14 8 B's ſhare.

Proof, 24

Sect. III. Barter.

(105.) Barter is the exchanging of commodities; and as neither party is ſuppoſed to ſuſtain any loſs, when the commodities exchanged are not of equal value, the defect is ſupplied with money, &c.

(209.) Case I. When the quantity of one commodity is given, with its value or that of its integer; as alſo the value of the integer, or rate of ſelling ſome other commodity to be given for it, to find the quantity of this; or having the quantity of the latter given, to find the rate of ſelling it. If the amount of the given quantity be unknown, calculate it in the ſhortſt manner you can

can, from the given value of its integer; then find how much of the other quantity this amount will purchaſe, at the given rate of ſelling it; or if the quantity be given, from thence find the rate of ſelling it.

(210.) CASE II. If the quantities of both commodities, with the rate of ſelling them, be given; to find what quantity of ſome other commodity or money muſt be given in caſe of an inequality of the amount of the firſt commodities. Calculate the amount of each of the two given commodities; then their difference is the money, or amount of the third commodity to be advanced; whoſe quantity, from thence and its rate, is eaſily found.

(211.) CASE III. When, in bartering, one commodity is rated above the ready money price; to find the quantity and bartering price of the other commodity. As the ready money price of the one is to its bartering price, ſo is that of the other to its barter price; then the quantity of the latter commodity may be found either from the ready-money or bartering prices.

Theſe are the moſt general caſes in barter, and ſuch queſtions as are not contained in them, are eaſily reſolved from a little conſideration of their nature.

SECT. IV. Loss *and* Gain.

(212.) Queſtions in this rule are ſuch whoſe ſolutions determine the LOSS or GAIN upon commodities; of which queſtions there is a great variety; but they may be all eaſily ſolved from a little conſideration and the following proportion, viz. That the *gains* or *loſſes* are in proportion as the *quantities* of goods, &c.

SECT. V. Exchange.

(213.) By exchange is meant the bartering or exchanging of the money of one place for that of another; and, like the bartering of wares, it commonly conſiſts in finding what quantity of the money of one place will be equal to a given ſum of another, according to a given courſe of exchange.

(214.) By COURSE of exchange is meant the variable ſum of the money of one place which is propoſed to be given for a conſtant piece or ſum of that of another, to ſerve for the preſent as a rate or proportion by which to exchange other ſums; and it is ſometimes above and ſometimes below the *par*.

(215.) By the PAR of exchange is meant an intrinſic equality between two pieces or ſums of money, one of which is the conſtant piece or ſum to which the courſe is compared. The money in the banks of foreign places is finer or purer than that which is current in them; and the difference between any ſum, as valued in the one, and its value in the other, is called *agio*.

(216.) It is by comparing the bank money with ours, that the par is aſcertained. The exchange is always ſuppoſed to be made in bank money; and if there be a neceſſity for taking currency in caſe of a defect of the bank to anſwer the bills, the more of it muſt be received, and that in proportion to the agio.

I. *With* Ireland, America, *and the* West Indies.

(217.) Accounts are kept in Ireland, America, and the Weſt Indies, in pounds, ſhillings, and pence, as in England; and the exchange *per cent.* ſterling; the par being 108l 6s 8d Iriſh per 100l ſterling, or 1l 1s 8d per pound; alſo 5l ſterling is accounted worth 7l of the currency of the Weſt Indies, becauſe of the plenty of foreign coins there.

II. *With* Holland, Flanders, *and* Germany.

(218.) In theſe places accounts are kept ſometimes in pounds, ſhillings, and pence, as in England; and ſometimes in guilders, ſtivers, and pennings. The money of Holland and Flanders is diſtinguiſhed by the epithet *Flemiſh*, and they exchange by the pound ſterling, the par being 33s 4d Flemiſh per pound ſterling.

IN HOLLAND AND FLANDERS.

16 pennings make 1 ſtiver.
20 ſtivers or 40 pence—1 guilder or florin.
8 pennings—1 grote or penny.
12 grotes or pence—1 ſkilling.
20 ſkillings—1 pound.

IN GERMANY.

12 pennings—1 ſhilling lubs.
16 lubbiſh ſhillings—1 mark.
6 pennings—1 grote flem.
6 lubbiſh ſhil.—1 ſkil. flem.
7½ marks lubs—1 pound flem.

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III. *With* France.

(219.) In France, accounts are kept in livres, ſols, and deniers; exchange being made by the French crown, the par of which is 2s 6d ſterling, or 2s 5¼ more nearly.

12 deniers—a ſol or ſou, value	0	0	½
20 ſols—a livre - - - - - -	0	9	¼
3 livres—1 crown or ecu - -	2	5	¼

IV. *With* Spain.

(220.) In Spain they keep their accounts in piaſtres, rials, and mervadies; reckoning 272 mervadies to a rial, and 8 rials to a piaſtre, by which they exchange, and its par is 4s 6d ſterling.

V. *With* Italy.

(221.) In Genoa and Leghorn they keep their accounts in livres, ſols, and deniers, as in France, but exchange by the piaſtre, as in Spain, which in Genoa is accounted 5 livres, and at Leghorn 6. At Venice too, accounts are by ſome kept in the ſame manner, and by others in ducats and groſs, reckoning 24 groſs to a ducat, upon which they exchange, and its par is accounted 4s 4d ſterling.

VI. *With* Portugal.

(222.) In Portugal accounts are kept in milreas and reas, reckoning 1000 reas to a milrea, as its name imports; and they exchange by the milrea, the par of which is about 6s 8½d or 6s 9d ſterling.

(223.) GENERAL RULES, ſhewing on what manner computations reſpecting the compariſon of monies are to be made.

I. Reduce the given ſum, (if neceſſary) to that kind of money by which exchange is computed.

II. Reduce this, according to the given rate of exchange, into the correſponding money of the other country.

III. Reduce the exchange of money thus found (if neceſſary) to the kind of money required.

(224.) EXAMPLES.

I. How much ſterling money is in 5476 guilders, current exchange 36s 3d flemiſh per pound ſterling, agio 2½ per cent.

102.5 : 100 :: 5476
100 G. Ban.

102.5)547600)5342.4
40

d £ s d
368 3d=435)213696c(491 5 6

Here, agreeably to the firſt of the preceding general rules, we reduce 5476 guilders current, to 5342.4 Banco, by the proportion of 102½ to 100, this again is brought to pence flemiſh, by multiplying by 40 the pence in a guilder; and ſince 36s 3d or 435d flemiſh is worth 1l ſterling, therefore divide by 435, and the quotient 491l 5s 6d, is the ſterling money required.

II. How many current guilders in 100l. ſterling, ex 34s 8d flem. per £ ſter. agio 2 per cent.

£ : d flem. :: £
1 : 416 :: 100
100

s d
34 8
12
416

41600 d. flem. Banco.

100 : 102 :: 41600
102

83200
416000

100)4243200

40)42432 d. current.

1060 guil. 16 ſtivers. Anſ.

SECT. VI. ARBITRATION OF EXCHANGES.

(225.) As the courſe or rate of exchange between one nation and another, is almoſt continually varying, either by riſing or falling, from the variations in the circumſtances and balance of trade: ſo the deſign of arbitration is to remit or draw upon foreign places in ſuch a manner, as ſhall turn out the moſt profitable.

(226.) Arbitration is generally divided into two parts, SIMPLE and COMPOUND.

I. SIMPLE ARBITRATION.

(227.) In ſimple arbitration the exchanges among three places only are concerned. The PAR *of* ARBITRATION, *or* ARBITRATED PRICE, is ſuch a rate of exchange between two places, as ſhall be in proportion with the rates aſſigned between each of them and a third place. After this par of arbitration is computed, by comparing it with the preſent courſe of exchange, a perſon can judge which way to remit or draw to the moſt advantage, and determine what the advantage ſhall be.

(228.) Ex. The exchange between London and Amſterdam being 33s 9d per pound ſterling, and the exchange between London and Paris 3s 9d per crown; the par of arbitration between Amſterdam and Paris is required.

ANSWER. By reduction 1l ſter. = 240d ſter. and 33s 9d flem. = 404d flem.

d.ſter. d.flem. d.ſter d.flem.
Then 240 : 404 :: 32 : 54

The par of arbitration therefore, between Amſterdam and Paris is 54d flem. per crown.

II. COMPOUND ARBITRATION.

(229.) Compound arbitration reſpects the caſes in which the exchanges between three, four, or more places are concerned.

(230.) A perſon who knows at what rate he can draw or remit directly, and alſo hath advice of the courſe of exchange in foreign places, may trace out a path for circulating his money, through more or fewer of ſuch places, and alſo in ſuch order, as to make a benefit of his ſkill and credit: and herein lies the great art of ſuch negociations.

(231.) But to determine in what order, and through how many places to circulate a bill, no general rule can be given, as it depends entirely upon a perſon's judgment, and a cloſe attention to the reſults of former caſes of the like kind. The following rules, however, may aſſiſt in determining, whether a direct or an aſſigned circular draft be preferable.

(232.) RULE I. Diſtinguiſh the given rates or prices in the circular courſe, into antecedents and conſequents; and place the antecedents in one column, and the conſequents in another, on the right fronting one another, by way of equation. And in this diſtribution into antecedents and conſequents, each conſequent muſt be of the ſame kind with the next antecedent, and the firſt antecedent of the ſame kind with the laſt conſequent, what muſt be the ſum whoſe value in exchange is required.

II. Multiply the antecedents continually for a diviſor, and the conſequents continually for a dividend; and the quotient of the product will be the value of the ſum required by ſuch exchange.

III. Then compute its value by the direct exchange, or by any other circular exchange, and by comparing the values together you will perceive the moſt advantageous method.

(233.) EXAMP. If London would remit 100l Sterling to Spain, the direct exchange being 42½d per piaſtre of 272 mervadies; it is required whether will be moſt profitable, the direct remittance, or by remitting firſt to Holland, at 35s per £: thence to France, at 58d per crown; thence to Venice, at 100 crowns per 60 ducats; and thence to Spain, at 360 mervadies per ducat.

ANTECEDENTS.		CONSEQUENTS.
1l Sterling	=	35s or 420d Flemiſh
58d Flemiſh	=	1 crown
100 crowns	=	60 ducats
1 ducat	=	360 mervadies
272 mervadies	=	1 piaſtre
How many piaſtres	=	100l Sterling.

Then $\frac{420\times60\times360\times1000}{58\times100\times272}=\frac{210\times30\times45\times10}{29\times17}$

$=\frac{2835000}{493}=5750\frac{340}{493}$ piaſtres = the value of 1000l. by the circular exchange.

But $42\frac{1}{2}$d : 1 piaſtre :: 1000l or 2400000d : $\frac{480000}{85}=\frac{96000}{17}=5647\frac{1}{17}$ piaſtres, the value by the direct exchange.

(234.) Thus it is plain that the circular exchange is the moſt advantageous, as it produces $103\frac{1}{17}$ piaſtres more than the other.

SECT. VII. ALLIGATION.

(235.) Alligation is the method of mixing together ſeveral ſimples of different qualities, ſo that the compoſition may be of a middle quality: and it is commonly diſtinguiſhed into two principal caſes, denominated *alligation medial*, and *alligation alternate*.

CASE I. ALLIGATION MEDIAL.

(236.) Alligation medial is the method of finding the rate of the compound, from having the rates and quantities of the ſeveral ſimples given.

(237.) RULE. Multiply each quantity by its rate; then divide the ſum of the products, by the ſum of the quantities, or the whole compoſition; and the quotient will be the rate of the compound required.

(238.) Ex. A compoſition being made of 5 lb of tea at 7s per lb, 9 lb at 8s 6d per lb, and 14 lb at 8 10d per lb; what is a lb of it worth?

d		l	s
—	× 5 =	1	15 —
6	× 9 =	3	16 6
10	× 14 =	4	1 8

28)9 13 2(—6s $10\frac{1}{2}$d per lb. *Ans.*

CASE II. ALLIGATION ALTERNATE.

(239.) Alligation alternate is the method of finding what quantity of each of the ſimples, whoſe rates are given, will compoſe a mixture of a given rate; ſo that it is the reverſe of alligation medial, and may therefore be proved by it.

(240.) RULE 1. Write the rates of the ſimples in a column under each other. 2. Connect, or link with a continued line, the rate of each ſimple which is leſs than that of the compound, with one or any number of thoſe which are greater than the compound; and each greater rate with one or any number of the leſs. 3. Write the difference between the mixture rate and that of each of the ſimples oppoſite the rates with which theſe are linked. 4. Then if only one difference ſtand againſt any rate, it will be the quantity belonging to that rate; but if there be ſeveral, their ſum will be the quantity.

(241.) It appears from the above rule, that many of the queſtions of this caſe will admit of various anſwers; but from an algebraic proceſs it appears that they will all have infinite varieties of anſwers; After one or more anſwers are found by the rule, a great number more are found by increaſing or decreaſing the quantities in any proportion, or by only increaſing or decreaſing any one or more ſingle pairs of yoke-fellows in any proportion, and leaving the other rates as they are; but that anſwer is commonly deſired which gives the rates in the leaſt integer numbers, and thoſe the neareſt to each other.

(242.) EXAMPLE. How much corn at 2s 6d, at 3s 8d, at 4s, and at 4s 8d, per buſhel, muſt be mixed together, and the compound may be worth 3s 10d per buſhel?

(243.) Rates.

		s	d	
30		2	10	12 or 2 at 2 6
44	46	2	10	12 or 2 at 3 8
48		16	2	18 or 3 at 4 0
56		16	2	18 or 3 at 4 8

(244.) Sometimes one or more of the ingredients, and ſometimes the whole compoſition is limited to a certain quantity; which may be divided into the three following caſes or limitations.

(245.) LIMITATION I. When the whole compoſition is limited to a certain quantity, and that is not found from the method of linking, and taking the differences; augment or diminiſh the quantity of each ingredient in the ſame proportion as the given quantity is greater or leſs than the total quantity found from the linking, by ſaying, As the total quantity ſo found, is to the given quantity, ſo is the quantity of each ingredient, found by linking, to the required quantity of each.

(246.) LIMITATION II. When one of the ingredients is limited to a certain quantity, and that quantity is not found by the method of linking; either augment or diminiſh the quantities of all the reſt, in the ſame proportion as the given quantity is greater or leſs than the quantity of the limited ſimple found by linking, by ſtating as in the firſt limitation: or, only augment, or diminiſh in the above proportion, that part of the quantity of the ingredients with which the limited one is linked, which is the difference of the mixture rate and the rate of the limited ſimple, and add the reſulting quantity of the other parts, inſtead of the ſaid difference; keeping the quantities of the other ſimples unaltered.

(247.) LIMITATION III. If more than one of the ſimples be limited, find, by Caſe 1. what will be the rate of a mixture made of the given quantities of the limited ſimples only; then conſider this as the rate of a limited ſimple, whoſe quantity is the ſum of the firſt given limited ſimple, from which, and the rates of the limited ſimples, by the ſecond limitation, calculate the quantity of each.

SECT. VII. INVOLUTION.

(248.) A power is a number produced by multiplying any given number continually by itſelf a certain number of times.

(249.) Any number is called the FIRST power of itſelf; if it be multiplied by itſelf, the product is called the *ſecond* power, and ſometimes the ſquare; if this be multiplied by the firſt power again, the product is called the *third* power, and ſometimes the cube; and if this be multiplied by the firſt power again, the product is called the *fourth* power; and ſo on; that is, the power is denominated from the number which exceeds the multiplications by 1.

Thus: 3 is the first power of 3.
3 × 3 = 9 is the second power of 3.
3 × 3 × 3 = 27 is the third power of 3.
3 × 3 × 3 × 3 = 81 is the fourth power of 3.
&c. &c.

(250.) Involution is the finding of powers; to do which, from their definition there evidently arises this RULE. Multiply the given number, or first power, continually by itself, till the number of multiplication be 1 less than the index of the power to be found, and the last product will be the power required.

(251. EXAMP. 1 What is the cube of 12·5?
12·5 × 12·5 × 12·5 = 1953·125 Answer.
2 What is the square of $3\frac{1}{2}$ or $\frac{17}{5}$?
$\frac{17}{5} \times \frac{17}{5} = \frac{289}{25} = 11\cdot56$. Answer.

SECT. IX. EVOLUTION.

(251.) The root of any given number or power, is such a number as being multiplied by itself a certain number of times, will produce the power; and it is denominated the first, second, third, fourth, &c. root, respectively, as the number of multiplications made of it to produce the given power is 0, 1, 2, 3, &c. that is the name of the root is taken from the number which exceeds the multiplications by 1, like the name of the power in involution.

(252.) EVOLUTION is the finding of the roots of numbers, either accurately or in decimals to any proposed extent.

(253.) The power is first to be prepared for extraction, or evolution, by dividing it from the place of units, to the left hand in integers, and to the right in decimal fractions, into periods, containing each as many places of figures as are denominated by the index of the root, if the power contain a complete number of such periods: if it do not, the defect will be either on the right hand, or left, or both; if the defect be on the right hand, it may be supplied by annexing cyphers, and after this whole periods of cyphers may be annexed to continue the extraction with, if necessary; but if there be a defect on the left, such defective period must remain unaltered, and is accounted the first period of the given number, as if it were complete.

(254.) This division may be conveniently made by writing a point over the place of units, and also over the last figure of every period on both sides of it; that is, over every second figure if it be the second root, over every third if it be the third root, &c.

Thus to point this number 21035896·127350;
for the second root, it will be 21035896·127350;
and for the third root, thus 21035896·127350;

(255.) The root will contain just as many places of figures as there are periods or points in the given power; and they will be integers, or decimals respectively, as the periods are so from which they are found, or to which they correspond, that is, there will be as many integer or decimal figures in the root, as there are periods of integers or decimals in the given number.

(256.) TO EXTRACT THE SQUARE ROOT.

I. Having pointed the given number into periods of two figures each, find a square number either equal to, or the next less than the first period, which subtract from it, and place the root of the square on the right of the given number, after the manner of a quotient in division, for the first figure of the root required.

II. To the remainder annex the second period for a dividend; and on the left hand of it write the double of the root already found, after the manner of a divisor.

III. Consider what figure, which, if annexed to the divisor, and the result multiplied by it, the product may be equal to, or the next less than the dividend, and it will be the next figure of the root.

IV. From the dividend subtract the product, and to the remainder bring down the next period, for a new dividend: to which as before, find a divisor by doubling the figures already found in the root; and from these find the next figure of the root, as in the last article; and continuing the operation still in the same manner, till all the periods be used, or as far as you please.

(257.) When the root is to be extracted to a great number of places, the work may be much abbreviated thus: having proceeded in the extraction, after the common method, till half the required number of figures in the root is found, the rest may be found by dividing the last remainder by its corresponding divisor, annexing a cypher to every individual, as in division of decimals; or rather, without annexing cyphers, by omitting continually the right-hand figure of the divisor, after the manner of contractions in division of decimals, § 169.

So the operation for the root of 2 to 12 or 13 places, may be thus.

```
2 ( 1·41421356237 + root
  1
 ---
24 | 100
 4 |  96
 ---
281 | 400
  1 | 281
 ----
2824 | 11900
   4 | 11296
 -----
28282 | 60400
    2 | 56564
 ------
282841 | 383600
     1 | 282841
 -------
2828423 | 1007,000
      3 |  8485269
 --------
28284266 ) 1590631 ( 56237 +
           176418
             6712
             1055
              206
                8
```

(258.) By

(258.) By means of the square root also we readily find the 4th root, or the 8th root, or the 16th root, &c. that is, the root of any power whose index is some power of the number 2; namely, by extracting so often the square root as is denoted by that power of 2; that is, two extractions for the fourth root, three for the 8th root, and so on.

(259.) *To* EXTRACT *the* CUBE ROOT.

I. Having divided the great number into periods of three figures each, find the nearest less cube to the first period; set its root in the quotient, and subtract the said cube from the first period; to the remainder bring down the second period, and call this the RESOLVEND.

II. To three times the square of the root, just found, add three times the root itself, setting this one place more to the right than the former, and call this sum the divisor. Then divide the resolvend, wanting the last figure, by the divisor, for the next figure of the root, which annex to the former; calling this last figure e, and the part of the root before found call a.

III. Add together these three products, namely, thrice a square multiplied by e, thrice a multiplied by e square, and e cube, setting each of them one place more to the right than the former, and call the sum the SUBTRAHEND; which must not exceed the resolvend; and if it does, then make the last figure e less, and repeat the operation for finding the subtrahend.

IV. From the resolvend take the subtrahend, and to the remainder join the next period of the given number for a new resolvend; to which form a new divisor from the whole root now found; and from thence another figure of the root, as directed in article II, &c.

(260.) EX. To extract the cube root of 48228·544

$3 \times 3^2 = 27$ | 48228·544 (36·4 root.
$3 \times 3 \times 09$ | 27
Divisor 279 | 21228 resolvend

$3 \times 3^3 \times 6 = 162$
$3 \times 3 \times 6^2 = 324$ } add
$6^3 = 216$

$3 \times 36^2 = 3888$ | 19656 subtrahend
$3 \times 36 = 108$
38988 | 1572544 resolvend

$3 \times 36^2 \times 4 = 15552$
$3 \times 36 \times 4^2 = 1728$ } add
$4^3 = 64$

1572544 subtrahend

oooooo remainder

(261.) *To* EXTRACT *any* ROOT WHATEVER.—Let G be the given power or number, n the index of the power, find by trials a power nearly equal to the given power or number, and having a rational root. Let this assumed power be A and its root r, and let R be the required root of G.

Then as the sum of $n+1$ times A and $n-1$ times G, is to the sum of $n+1$ times G and $n-1$ times A, so is the assumed root r, to the required root R.

Or, as half the said sum of $n+1$ times A and $n-1$ times G, is to the difference between the given and assumed powers, so is the assumed root r, to the difference between the true and assumed roots; which difference added or subtracted gives the true root nearly.

That is, $\overline{n+1}.A+\overline{n-1}.G; \overline{n+1}.G+\overline{n-1}.A :: r : R$.

Or, $\overline{n+1}.\frac{1}{2}A+\overline{n-1}.\frac{1}{2}G : A \text{ or } G :: r : R \text{ or } r$.

And the operation may be repeated as often as we please, by using always the last found root for the assumed root, and its nth-power for the assumed power A.

(262.) EX. To extract the 5th root of 21035·8. Here it appears that the 5th root is betwen 7·3 and 7·4. Taking 7·3, its 5th power is 20730·71593. Hence then we have

$G = 21035{\cdot}8 : r = 7{\cdot}3; n = 5; \frac{1}{2}.n+1 = 3; \frac{1}{2}.n-1 = 2.$
$A = 20730{\cdot}716$

G−A = 305·084

A = 20730·716 G = 21035·8
3 2

3 A = 62192·148 42071·6
2 G = 42071·6

As 104263·7 : 305·084 :: 7·3 : ·0213605
73

915252
2135588

104263·7)2227·1132(·0213605 the diff.
14184 7·3 = r add

3758 7·3213605 = R the root
630 true to the
5 last figure.

(263.) GENERAL RULES *for* EXTRACTING ANY ROOT *out of a Vulgar Fraction or Mixt Number.*

I. If the given fraction have a finite root of the kind required, it is best to extract the root out of the numerator and denominator, for the terms of the root required.

II. But if the fraction be not a complete power, it may be thrown into a decimal, and then extracted. Or,

III. Take either of the terms of the given fraction for the corresponding term of the root; and for the other term of the root, extract the required root of the product, arising from the multiplication of such a power of the first assigned term of the root whose index is less by 1 than that of the given power, by the other term of the given number. This rule will do when the root is either finite or infinite.

IV. Mixt numbers may be reduced either to improper fractions or decimals, and then extracted.

SECT. X. POSITION.

(264.) THIS rule is also called FALSE POSITION or false supposition, because it makes a supposition of false numbers, as if they were the true ones, and

and by their means, discovers the true numbers sought. The single rule uses only one supposition, but the double rule two; whence their names.

(265.) To the rule of position belong such questions as cannot be solved by the direct process by any of the former rules; and in which the required number or numbers do not ascend above the first power; such, for example, as most of the questions usually brought to exercise the reduction of simple equations in algebra. But it will not bring out true answers, when the numbers sought ascend above the first power; for then the results are not proportional to their positions, nor the errors to the difference of the true number and each position; yet, in all such cases, it is a very good approximation, and in exponential equations, as well as many other things, succeeds better than perhaps any other method.

(266.) Those questions, in which the results are proportional to their suppositions, belong to single position; such are those which require the multiplication or division of the number sought by any number, or in which it is to be increased or diminished by itself any number of times, or by any part or parts of it. But those in which the results are not proportional to their positions, belong to the double rule; such are those, in which the number sought is increased or diminished by some given number, which is no known part of the number required.

(267.) RULE. Take any number, and perform the same operations with it as, in the question, are described to be performed with the number sought; then, if the result be the same with that in the question, the supposed number is the number sought; but if it be not, say, as the result of the operation is to the position, so is the result in the question to the number required.

(268.) EXAMPLE.

A person after spending $\frac{1}{3}$ and $\frac{1}{4}$ of his money, has yet remaining L. 60; what had he at first?

1. Suppose he had at first L. 120.		PROOF.	
Now $\frac{1}{3}$ of 120 is	40	$\frac{1}{3}$ of 144 is	48
$\frac{1}{4}$ of it is	30	$\frac{1}{4}$ of it is	36
their sum is	70	their sum	84
which taken from	120	taken from	144
leaves	50	leaves	60
		as per question.	

Then, $50 : 120 :: 60 : \frac{60 \times 120}{50} = \frac{60 \times 12}{5}$

$= 12 \times 12 = 144$.

SECT. XI. DOUBLE POSITION.

(269.) RULE. Having taken any two convenient numbers, for the positions, proceed with each, according to the conditions of the question, as if it were the true number sought; and find how much the results are different from the result in the question. Next multiply each of these errors or differences by the other's position; then if the errors be of the same affection, that is, if the results be both either too great or too little, divide the difference of the products by the difference of the errors, and the quotient will be the answer; but if the errors be of different affections, that is, if one result be too great, and the other too little, divide the sum of the products by the sum of the errors, and the quotient will be the answer.

(270.) Or, having found the errors, say, As the sum or difference of the errors, according as they are of a different, or the same kind, if to the difference of the suppositions, so is the least error to the correction of the supposition belonging to that error; which must be added to, or subtracted from it, according to the following conditions, viz. If the errors be of the same kind, add, or subtract the correction, to or from this supposition, according as it is greater or less than the other supposition; but if the errors be of different kinds, add, or subtract, according as the supposition is the less or the greater of the two; and the sum or difference will be the number sought.

(271.) EXAMPLE.

What number is that, which being multiplied by 6, the product increased by 18, and the sum divided by 9, the quotient will be 20?

First, suppose 30 to be the number sought.

Then $\frac{30 \times 6 + 18}{9} = 10 \times 2 + 2 =$

$= 22$; but ought to be 20; therefore the error is 2 in excess.

Again, suppose 16 to be the number sought.

Then $\frac{18 \times 6 + 18}{9} = 2 \times 6 + 2 = 12 +$

$= 14$; but ought to be 20; therefore the error is 6 in defect.

And the errors are of different kinds or affections.

Whence, by the first rule, $\frac{30 \times 6 + 18 \times}{2 + 6 =}$

$= \frac{15 \times 3 + 9}{2} = \frac{54}{2} = 27$, the number sought.

And, by the second rule, $2 + 6 : 30 - 1$

$2 : \frac{2 \times 12}{8} = 3$, the correction; than $30 - 3 =$

27, the number sought.

CONCLUSION

(272.) We cannot conclude our account of this Science, without acknowledging, that in drawing up the above treatise, we have borrowed freely from the celebrated Dr HUTTON's "Compendious Treatise on Practical Arithmetic;" though we have by no means restricted ourselves entirely to it. Agreeably to this plan, in treating of the *Rule of Three*, we have omitted the common distinction of it into *direct* and *inverse*, and have adopted the general rule for the operation, which renders it perfectly easy in every respect, and even includes questions of *compound Proportion*. We have also, in treating of DECIMALS, omitted the distinction of APPROXIMATE, CIRCULAR, TERMINATE and INTERMINATE; reserving the reader for an account of these branches of decimal arithmetic to the articles, DECIMALS and LOGARITHMS. We

have also adopted Dr Hutton's, or rather Sir Isaac Newton's method of *pointing* our decimals, by placing the separating points against the upper part of the figures, to prevent their being mistaken for stops or pauses in the reading.

(273.) We shall only add, in illustration of what we advanced, (§ 35.) respecting the CYPHER, that, for want of this useful character, the ancients could make no distinction between units, tens, hundreds, &c. by their local situation. They invented numberless characters, (by far too many indeed,) to express different numbers; but for want of this *representative of nothing*, they could make no distinction of the *value* of figures by their *places*. It is in *this*, that the perfection of modern arithmetic in a great measure consists; the cypher, being the representative of nothing, is ready on all occasions to supply the place of units, tens, hundreds, &c. to the utmost extent of numeration, (if the paradox may be pardoned, to speak of an *utmost extent* in a case of *infinity*,) as often as the figures, previously occupying these places, require, by addition, multiplication, &c. to be transferred to a higher class. This use of the cypher it must be obvious could not take place, with equal regularity and uniformity, (if, indeed, it could at all,) upon any other plan but that of the DECADARY system. When the sexagesimal arithmetic was invented by Ptolemy, the cypher and the nine digits were not known: and his marks above enumerated (§ 14.) clearly show how imperfect every other system but the decadary, must prove in practice.

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ARITHMETIC, BINARY, or DYADIC, is that wherein only two figures, unity, or 1, and 0, are uſed. See BINARY. M. Dangicourt, in the Miſcell. Berol. gives a ſpecimen of the uſe hereof in arithmetical progreſſions.

ARITHMETIC, DECADAL, or ARITHMETIC, DECADARY, } Arithmetic performed by a ſeries of ten characters, ſuch as we now uſe. See ARITHMETIC, § 32—35, and 273.

ARITHMETIC DECIMAL, the arithmetic of decimal fractions. See ARITHMETIC, *Index*.

ARITHMETIC, DYADIC. See ARITHMETIC, BINARY.

ARITHMETIC, INSTRUMENTAL, a ſpecies of arithmetic, wherein the common rules are performed by means of inſtruments contrived for expedition: ſuch as, ſeveral ſorts of ſcales, and ſliding rules, &c. particularly thoſe denominated NAPIER'S BONES, which ſee. The Chineſe uſe inſtruments in their calculations, and pay little regard to arithmetical rules. See ABACUS, and SCHWAN-PAN.

ARITHMETIC, LITERAL or SPECIOUS, arithmetic performed by letters inſtead of figures. See ALGEBRA.

ARITHMETIC, LOGARITHMICAL. See LOGARITHMS.

ARITHMETIC, NUMEROUS, that which is performed by numbers.

ARITHMETIC OF INFINITES, a method invented by Dr Wallis, of ſumming up a ſeries of numbers, conſiſting of infinite terms, or of finding the ratios thereof. It is uſeful in geometry, but every thing performed by it, is more eaſily operated by FLUXIONS.

ARITHMETIC OF RATIONALS and IRRATIONALS. See RATIONAL, &c.

ARITHMETIC, POLITICAL, is the application of arithmetic to political ſubjects; as, the ſtrength and revenues of princes, number of inhabitants, births, burials, &c.

ARITHMETIC, SEXAGENARY, or ARITHMETIC, SEXAGESIMAL, } See ARITHMETIC, *Index*.

ARITHMETIC, SPECIOUS. See ARITHMETIC, LITERAL.

ARITHMETIC, TETRACTICAL, is that wherein only the figures 1, 2, 3, and 0, are uſed. We have a treatiſe of this arithmetic by Erhard Weigel; but both binary and tetractic are little better than curioſities, eſpecially with regard to practice; inaſmuch as, the numbers may be much more compendiouſly expreſſed by decadary arithmetic, than by either of them.

ARITHMETIC, VULGAR, is that converſant about integers and vulgar fractions.

* ARITHMETICAL. *adj.* [from *arithmetick.*] According to the rules or method of arithmetick.—The principles of bodies may be infinitely ſmall, not only beyond all naked or aſſiſted ſenſe, but beyond all *arithmetical* operation or conception. *Grew.*

ARITHMETICAL COMPLEMENT of a logarithm, is what the logarithm wants of 10·0000000. Thus the arithmetical complement of 7·1079054, is 2·8920946, where each figure but the laſt is ſubtracted from 9, and that from 10. It is ſometimes alſo uſed in trigonometrical calculations, when radius or 10·0000000 is the firſt term, to ſave the labour of ſubtraction. It is diſtinguiſhed by placing a point before, and another after the index; thus, ·2·8920946.

ARITHMETICAL MEDIUM or MEAN. See MEDIUM.

ARITHMETICAL PROGRESSION. See PROGRESSION.

ARITHMETICAL PROPORTION. See PROPORTION.

ARITHMETICAL RATIO. See RATIO.

* ARITHMETICALLY. *adv.* [from *arithmetical.*] In an arithmetical manner; according to the principles of arithmetick.—Though the fifth part of a ſextes being a ſimple fraction, and *arithmetically* regular, it is yet no proper part of that meaſure. *Arbuthnot on Coins.*

* ARITHMETICIAN. *n. ſ.* [from *arithmetick.*] A maſter of the art of numbers.—A man had need be a good *arithmetician*, to underſtand this author's works. His deſcription runs on like a multiplication table. *Addiſon.*

* ARITHMETICK. *n. ſ.* [ἀριθμὸς, number, and μέτρον, to meaſure.] The ſcience of numbers; the art of computation.—

But now, 'tis odds beyond *arithmetick. Shak.*

ARITHMOMANCY. See ARITHMANCY.—The gematria, which makes the firſt ſpecies of the Jewiſh Cabbala, is a ſort of arithmomancy.

(1.) ARIUS, a divine of the fourth century, the head and founder of the ARIANS, a ſect which denied the eternal divinity and ſubſtantiality of the Word. He was born in Libya, near Egypt. Euſebius, biſhop of Nicomedia, a great favourite of Conſtantia, ſiſter of the emperor Conſtantine, and wife of Licinius, became a zealous promoter of Arianiſm. He took Arius under his protection, and introduced him to Conſtantia; ſo that the ſect increaſed, and ſeveral biſhops embraced it openly. There aroſe, however, ſuch diſputes in the cities, that the emperor aſſembled the council of Nice, where the doctrine of Arius was condemned, A. D. 325. Arius was baniſhed by the emperor, all his books were ordered to be burnt, and capital puniſhment was denounced againſt all who dared to keep them. After five years baniſhment, he was recalled to Conſtantinople, where he preſented the emperor, with a confeſſion of his faith, drawn up ſo artfully, that it fully ſatisfied him. Notwithſtanding this, Athanaſius, now biſhop of Alexandria, refuſed to admit him and his followers to communion. This ſo enraged them, that, by their intereſt at court, they procured that prelate to be depoſed and baniſhed. But the church of Alexandria, ſtill refuſing to admit Arius into their communion, the emperor ſent for him to Conſtantinople; where, upon delivering in a freſh confeſſion of his faith, in terms leſs offenſive, the emperor commanded Alexander, the biſhop of that church, to receive him the next day into his communion: but that very evening Arius died. The manner of his death was very extraordinary: as his friends were conducting him in triumph to the great church of Conſtantinople, Arius, preſſed by a natural neceſſity, ſtepped aſide, but expired on the ſpot, his bowels guſhing out; owing, as was ſuſpected, to poiſon. But his opinions did not die with him, his party continued ſtill in great credit at court. Athanaſius, indeed, was ſoon recalled from baniſhment, and as ſoon removed again; the Arians being countenanced by the government, and making and depoſing biſhops as it beſt ſerved their purpoſes. In ſhort, this ſect continued with great luſtre above 300 years; it was the reigning religion of Spain for above two centuries; it was on the throne, both in the eaſt and weſt; it prevailed in Italy, France, Pannonia, and Africa; and was not extirpated till about the end of the 8th century. Arianiſm was again revived in the weſt by Servetus, who, in 1531, wrote a little treatiſe againſt the myſtery of the Trinity; and died a martyr to his opinions. After his murder, the doctrine got footing in Geneva and Poland; but, at length, degenerated, in a great meaſure, into Socinianiſm. Eraſmus ſeems to have aimed at reviving Arianiſm, in his Commentaries on the New Teſtament; and the learned Grotius ſeems to lean that way, as well as Dr Clark and many others. With regard to the preſent ſtate of Arianiſm in England, it may be ſufficient to obſerve, that from the numerous publications daily making their appearance, it ſeems to be rather a growing, than exploded doctrine.

(2.) ARIUS, in geography. See ARIAS.

(1.) * ARK. *n. ſ.* [*arca*, Lat. a cheſt.] 1. A veſſel to ſwim upon the water, uſually applied to that in which Noah was preſerved from the univerſal deluge.—Make thee an *ark* of gopher wood; rooms ſhalt thou make in the *ark*, and ſhalt pitch it within and without with pitch. *Geneſis*, vi. 14. 2. The repoſitory of the covenant of God with the Jews.—This coffer was of ſhittim wood, covered with plates or leaves of gold, being two cubits and a half in length, a cubit and a half wide, and a cubit and a half high. It had two rings of gold on each ſide, through which the ſtaves were put for carrying it. Upon the top of it was a kind of gold crown all around it, and two cherubims were faſtened to the cover. It contained the two tables of ſtone, written by the hand of God. *Calmet.*

(2.) ARK, NOAH'S, CONJECTURES RESPECTING. The

The ark (See *Pl.* IV.) has afforded ſeveral points of curious inquiry among the critics and naturaliſts, relative to its form, capacity, materials, &c. The wood whereof the ark was built is called in the Hebrew *gopher wood*, and in the Septuagint *ſquare timbers*. Some tranſlate the original *cedar*, others *pine*, others *box*, &c. Pelletier prefers cedar on account of its incorruptibility, and the great plenty of it in Aſia; whence Herodotus and Theophraſtus relate, that the kings of Egypt and Syria built whole ſtreets thereof, inſtead of deal. The learned Mr Fuller, in his Miſcellanies, has obſerved, that the wood whereof the ark was built was nothing but that which the Greeks call κυπαρισσος, or the *cypreſs tree*; for, taking away the termination, *kupar* and *gopher* differ very little in ſound. This obſervation the great Bochart has confirmed, and ſhown very plainly that no country abounds ſo much with this wood, as that part of Aſſyria which lies about Babylon. In what place Noah built and finiſhed his ark is no leſs a matter of diſputation. But the moſt probable opinion is, that it was built in Chaldea, in the territories of Babylon, where there was ſo great a quantity of cypreſs in the groves and gardens in Alexander's time, that the prince built a whole fleet out of it for want of timber. And this conjecture is confirmed by the *Chaldean* tradition, which makes Xiſuthrus (another name for Noah) ſet ſail from that country. The time taken to build the ark is alſo much diſputed, ſome making it 52 years, others 78, 100 and 120. The Mahometans ſay it was made in 2 years.

(3.) ARK, NOAH'S, DIMENSIONS, DIVISIONS, &c. OF. The dimenſions of the ark, as given by Moſes, are 300 cubits in length, 50 in breadth, and 30 *in height*; which ſome have thought too ſcanty, conſidering the number of things it was to contain; and hence an argument has been drawn againſt the authority of the relation. To ſolve this difficulty many of the ancient fathers, and the modern critics, have been put to very miſerable ſhifts: But Buteo and Kircher have proved geometrically, that, taking the common cubit of a foot and a half, the ark was abundantly ſufficient for all the animals ſuppoſed to be lodged in it. Bellius computes the ark to have been above half an acre in area. Father Lamy ſhows, that it was 300 feet longer than the church of St Mary at Pa, and 64 narrower: and if ſo, it muſt have been larger than St Paul's church in London, from eaſt to eaſt, and broader than that church is high *the inſide*, and 54 feet of our meaſure in height. Arbuthnot computes it to have been 81062 tons. It contained, beſides eight perſons of Noah's family, one pair of every ſpecies of unclean animal, and 7 pair of every ſpecies of clean animals, with proviſions for them all during the whole year. The former appears, at firſt view, moſt infinite; but if we come to a calculation, the number of ſpecies of animals will be found much leſs than is generally imagined; out of which, in caſe, are excepted ſuch animals as can live in the water; and biſhop Wilkins ſhows that only 72 of the quadruped kind needed a place in the ark. By the deſcription Moſes gives of the ark, it appears to have been divided into three ſtories, each ten cubits or 15 feet high; and it is agreed on, as moſt probable, that the loweſt ſtorey was for the beaſts, the middle for the food, and the upper for the birds, with Noah and his family; each ſtorey being ſubdivided into different apartments, ſtalls, &c. though Joſephus, Philo, and other commentators, add a kind of fourth ſtorey, under all the reſt; being, as it were, the hold of the veſſel, to contain the ballaſt and receive the filth and faeces of ſo many animals: but F. Calmet thinks, that what is here reckoned a ſtorey, was no more than what is called the keel of the ſhips, and ſerved only for a conſervatory of freſh water. Drexelius makes 300 apartments; F. Fournier, 333; the anonymous author of the Queſtions on Geneſis, 400; Buteo, Temporarius, Arias Montanus, Hoſtus, Wilkins, Lamy, and others, ſuppoſe as many partitions as there were different ſorts of animals. Pelletier makes only 72, viz. 36 for the birds, and as many for the beaſts. His reaſon is, that if we ſuppoſe a greater number, as 333 or 400, each of the eight perſons in the ark muſt have had 37, 41, or 50 ſtalls to attend and cleanſe daily, which he thinks impoſſible to have been done. But it is obſerved, that there is not much in this: to diminiſh the number of ſtalls without a diminution of animals is vain; it being perhaps more difficult to take care of 300 animals in 72 ſtalls than in 300. As to the number of animals contained in the ark, Buteo computes that it could not be equal to 500 horſes; he even reduces the whole to the dimenſions of 56 pair of oxen. F. Lamy enlarges it to 64 pair of oxen, or 128 oxen: ſo that, ſuppoſing one ox equal to two horſes, if the ark had room for 256 horſes, there muſt have been room for all the animals. But the ſame author demonſtrates, that one floor of it would ſuffice for 500 horſes, allowing nine ſquare feet to a horſe. As to the food in the ſecond ſtorey, it is obſerved by Buteo from Columella, that 30 or 40 pounds of hay ordinarily ſuffices for an ox a day; and that a ſolid cubit of hay, as uſually preſſed down in our hay ricks, weighs about 40 pounds; ſo that a ſquare cubit of hay is more than enough for one ox in one day. Now, it appears, that the ſecond ſtorey contained 150,000 ſolid cubits; which divided between 206 oxen will afford each more hay, by two thirds, than he can eat in a year. Biſhop Wilkins computes all the carnivorous animals equivalent, as to the bulk of their bodies, and their food, to 27 wolves; and all the reſt to 280 beeves. For the former, he allows 1825 ſheep; and for the latter, 109,500 cubits of hay; all which will be eaſily contained in the two firſt ſtoreys, and a deal of room to ſpare. As to the third ſtorey, no body doubts of its being ſufficient for the fowls; with Noah, his ſons, and daughters. Upon the whole, the learned biſhop remarks, that of the two, it appears much more difficult to aſſign a number and bulk of neceſſary things to anſwer the capacity of the ark than to find ſufficient room for the ſeveral ſpecies of animals already known to have been there. This he attributes to the imperfection of our liſt of animals, eſpecially of thoſe of the unknown parts of the earth; adding, that the moſt expert mathematician at this day could not aſſign the proportion of a veſſel better accommodated to the purpoſe than is here done: and hence he concludes, that the capacity of the ark, which had been made an objection againſt ſcripture, ought

to be eſteemed a confirmation of its divine authority; ſince, in thoſe ruder ages, men, being leſs verſed in arts and philoſophy, were more obnoxious to vulgar prejudices than now; ſo that, had it been a human invention, it would have been contrived, according to thoſe notions which from a confuſed and general view of things as much *too big* as it had been repreſented too little. Beſides the places requiſite for the beaſts and birds, and their proviſions, there was room, therefore, ſufficient, for Noah's houſehold utenſils, inſtruments of huſbandry, and ſeeds to ſow after the deluge; for which purpoſes, he might ſpare room in the third ſtorey for 36 cabins; beſides a kitchen, a hall, 4 chambers, and a ſpace about 48 cubits in length to walk in.

(4.) ARK OF THE COVENANT, a ſmall cheſt or coffer, three feet nine inches in length, two feet three inches in breadth, and two feet three inches in height, in which were contained the golden pot with manna, Aaron's rod, and the tables of the covenant. This coffer was made of Shittim-wood, and covered with a lid of ſolid gold. See *Plate* IV. The ark was depoſited in the holieſt place of the tabernacle. It was taken by the Philiſtines, and detained 20, ſome ſay 40 years, at Kirjath-jearim; but the people being afflicted with emerods on account of it, returned it with divers preſents. It was afterwards placed in the temple. The lid of the ark was called the *propitiatory* or *mercy ſeat*; over which were two figures of cherubims placed, with expanded wings of a peculiar form. Here the Schechinah reſted, both in the tabernacle and temple, in a viſible cloud; and hence were iſſued the divine oracles by an audible voice. The high prieſt appeared before this mercy ſeat once every year on the great day of expiation; and the Jews, wherever they worſhipped, turned their faces towards the place where the ark ſtood. In the ſecond temple there was alſo an ark, made of the ſame ſhape and dimenſions with the firſt, and put in the ſame place, but without any of its contents and peculiar honours. It was uſed as a repreſentative of the former on the day of expiation, and a repoſitory of the original copy of the holy Scriptures, collected by Ezra and the men of the great ſynagogue, after the captivity.

(5.) ARK OF THE MODERN JEWS, &c. In imitation of the ark of the covenant, the Jews to this day have a kind of ark in their ſynagogues, wherein their ſacred books are depoſited. This they call *aron*. Leo of Modena gives a deſcription of it, in his Account of the Cuſtoms and Ceremonies of thoſe of his nation. "The Jews (ſays he) in the eaſtern ſides of their ſynagogues, have an ark, or armory, called ARON, to the memory of the ark of the covenant. In this are preſerved the five books of Moſes, written on vellum, with ink made on purpoſe." A cheſt, very nearly reſembling the Jewiſh ark, and called the *boue of the God*, was found in Huaheine, one of the iſlands in the ſouth ſea. Mr Banks could obtain no other information concerning it than what the name imports.

(II.) ARK, in geography, a river in Yorkſhire, which falls into the Swale, near Grinton.

(III.) ARK, or ARC, *arcus*, in geometry, aſtronomy, &c. See ARCH, § 3, 5, 8—10.

ARKEL, Cornelius Van, an eminent Dutch divine, born at Amſterdam in 1670: and educated under Limborch and Le Clerc. He was much admired as a preacher among the Remonſtrants or Arminians; and he publiſhed *Hadriani Junii Hagani, Medici animadverſa ejuſdemque de Coma Commentarius*, &c. He died in 1774.

ARKENHOLZ, John, a Swediſh author, born at Helſingfors, in 1695. He ſtudied at Upſal, and afterwards made the tour of the moſt of Europe. During his ſtay at Paris, he wrote a piece entitled *Conſiderations ſur la France par Rapport à la Suede*, in which he ſo ſeverely cenſured cardinal Fleury, that he complained of him to the court of Sweden. In conſequence of this he loſt the place which he enjoyed of regiſtrar; but in 1741 he obtained the office of ſecretary of public accounts. In 1746, he was keeper of the cabinet of curioſities at Caſſel; and ſome time after was employed in writing the hiſtory of Frederic I. which he never completed. He died in 1777. Beſides various pieces on political and other ſubjects he publiſhed the Letters of Grotius to Queen Chriſtina, and the Memoirs of that Queen.

ARKHUL. See ARCOLE, N° 2.

ARKLEY, a ſmall town in Yorkſhire, between Richmond and Weſtmoreland.

ARKLOW, a ſea-port town of Ireland, in the county of Wicklow, 13 miles S. of Wicklow, and 26 from Dublin. It had two repreſentatives in parliament. The tide flows very little on its coaſt. Lon. 6. 5. W. Lat. 52. 42. N.

ARKSTON, a ſmall town in Herefordſhire, between Druxton and Kingſton.

ARKWRIGHT, Sir Richard, the celebrated inventor of machinery for ſpinning and carding cotton. He was originally a barber at Wirkſworth, in Derbyſhire, and in low circumſtances. But about 1767 he changed his line of buſineſs and travelled through the country, buying hair; when coming to Warrington, he got acquainted with one John Kay, a clockmaker. To this man he ſpoke of ſome mechanical project he had in view; and by him his deſign was changed and his attention turned to the ſpinning of cotton. A machine was projected, and they applied to Peter Artherton, Eſq. now of Liverpool, who encouraged them to conſtruct it. For this machine Mr Arkwright afterwards took out a patent. He then joined in partnerſhip with a Mr Smally of Preſton in Lancaſhire, but being ſtraitened for room they went to Nottingham, where they got ſuch ſupport as enabled them to erect a cotton machine, which was worked by horſes. Mr Arkwright afterwards erected works at Cromford in Derbyſhire; and acquired a very great fortune. It has been ſaid he enriched himſelf at other men's expence and ingenuity; but though much attention had been paid to the invention of machines for ſpinning cotton, before Mr Arkwright engaged in it, it had been hitherto unſucceſsful; and the perfection to which he brought them, overcoming numerous difficulties, ſhows him to have been a man of great genius, and unwearied perſeverance. That his inventions have been of great national value, almoſt every corner of the country teſtifies. Upon preſenting an addreſs from the high ſheriff and hundred of Wirkſworth, he was knighted, in

1786, as high sheriff of the county of Derby. He died at his works at Crumford in Derbyshire, Aug. 3, 1793.

ACLAUD, James Antony, an eminent painter, born at Geneva, in 1668. Having gone to Paris in pursuit of his business, he was much patronized by the king; and it was here he painted his *Leda*, a copy of which he sold in London for 600l. Though he could not be induced to part with the original of this exquisite production, yet in a fit of enthusiasm, he destroyed it by cutting it in pieces. He died in 174 .

ARLE, a small town in Gloucestershire, a mile from Cheltenham.

(1.) ARLES, a large and ancient city of France, in the department of the Mouths of the Rhone, seated on the east side of that river on a hill, whose declivity is towards the north. It was called Arelas by the Romans. Constantine made it the seat of the Roman empire in Gaul; and Boson made it the capital of his kingdom of Burgundy. It is celebrated for its antiquities, many of which are still to be seen; such as the amphitheatre, the obelisk, the Elysian Fields, the sepulchres, columns with their capitals, busts, pedestals, aqueducts, with some remains of the capitol, and the Roman gods. Under the amphitheatre, in 1651, was found a statue of Venus, which was formerly worshipped in this city; and has been since carried to the castle of Versailles. It is a masterpiece which will always be admired by connoisseurs.—The amphitheatre was built by the Romans; some say by Julius Cæsar. It is of an oval form, and about 400 yards in circumference, and the front is 34 yards in height. The middle, called the *Arena*, is 142 yards wide, and 104 broad. The porticoes or piazzas are 3 stories, built with stones of a prodigious size. Each of them consists of 60 arches, which still remain; and the walls are of a surprising thickness, but gone to decay. The obelisk is the only one of this kind to be seen in France, it seems to be one of the 40 brought from Egypt to Rome, being of the same oriental granite.—They are generally full of hieroglyphic characters; but this is quite smooth. In 1675, it was found in a private garden near the walls of the city, not far from the Rhone. It consists of one piece; and is 52 feet high, and 7 in diameter at the base. It is now supported with four lions made of bronze; and on the top a blue ball is placed, and over that a sun. The ancient burying place, called the Elysian Fields lies without the city, upon an agreeable hill, and is divided into two parts. The first called *Moulaires*, has very few tombs, these having been broken to build the walls of gardens.—The 2d called *Elisebamp*, contains a great number. Those of the Pagans have the letters D. M. i. e. *diis Manibus*. Those of the Christians have a cross. Coins of gold and silver, pieces of bronze, urns, lamps, cups, &c. are often found here. Arles has an academy of sciences, consisting of 30 members, who must be natives, and inhabitants. The city is surrounded with marshy land, which renders the air full of vapours, and makes it unwholesome. The air of the country around, however, is salubrious, and the grounds produce excellent wines, fruits, olives, manna, vermillion, &c. Arles is situated 12 miles SE. of Nismes, 35. NW. of Marseilles, and 430 S. by E. of Paris. Lon. 4. 48. E Lat. 43. 40. N.

(4.) ARLES, a town of France in the department of the Eastern Pyrenees.

ARLESHEM, or ARLESHEIM, } A neat town of Switzerland, in the canton of Basil.

ARLEUF, a town of France in the department of Nievre.

ARLEUX, a town of France in the department of the North. It is situated in the *ci-devant* province of Hainault, six miles S. of Doway, and about as far from Cambray. Lon. 3. 10. E. Lat. 50. 26. N.

ARLINGHAM, 1. a village in Gloucestershire, near Berkeley almost surrounded by the Severn, which, at this place is near a mile broad, and the exhalations from which render the air unhealthy: 2. Another near Gloucester.

ARLON, a town of France, in the department of Forets, one of those departments, into which the ci-devant Austrian Netherlands were lately divided. It is seated on a mountain, 10 miles NW. of Luxemburg, according to Walker, but according to others 76 miles W. Lon. 5. 56. E. Lat. 49. 45. N.

ARLYNG, in ornithology, a name by which the common *œnanthe* is called in many parts of England.

(1.) *ARM. *n. f.* [*earm*, *eorm*, Sax.] 1. The limb which reaches from the hand to the shoulder.—If I have lift up my hand against the fatherless, when I saw my help in the gate, then let mine *arm* fall from my shoulder, blade, and mine *arm* be broken from the bone. *Job.* 2. The bough of a tree.—

The trees spread out their *arms* to shade her face,
But she on elbow lean'd. *Sydney.*

3. An inlet of water from the sea.—

Full in the centre of the sacred wood,
An *arm* ariseth of the Stygian flood. *Dryden.*

4. Power; might. In this sense is used the secular *arm*, &c.—Cursed be the man that trusteth in man, and maketh flesh his *arm*, and whose heart departeth from the Lord. *Jer.* xvii. 5.

(2.) ARM, in anatomy. See ANATOMY, *Index.*

(3.) ARM, in gardening, is sometimes used in respect of cucumbers and melons, in the same sense as branch of other plants.

(4.) ARM, in geography, a river in Devonshire.

(5.) ARM, in horsemanship, is applied to a horse, when, by pressing down his head, he endeavours to defend himself against the bit, to prevent his being checked by it. The remedy is, to have a wooden ball covered with velvet, or other matter, put on his chaul, which will so press him between the jaw-bones as to prevent his bringing his head so near his breast.

(6.) ARM, in magnetism. A loadstone is said to be armed, when it is capped, cased, or set in iron or steel, in order to make it take up the greater weight, and also to distinguish readily its poles. See MAGNETISM.

(7.) ARM OF AN ANCHOR, the part to which the fluke is set.

(1.) * *To* ARM. *v. a.* [*armo*, Lat.] 1. To furnish with armour of defence, or weapons of offence.—And when Abraham heard that his brother was taken

taken captive, he *armed* his trained ſervants, born in his own houſe, three hundred and eighteen, and purſued them unto Dan. *Geneſis.*

2. To plate with any thing that may add ſtrength.

Their wounded ſteeds
Yerk out their *armed* heels at their dead maſters. *Shakeſp.*

3. To furniſh; to fit up: as, to *arm* a loadſtone, is to caſe it with iron.—You muſt *arm* your hook with the line in the inſide of it. *Walton's Angler.*

4. To provide againſt.—

His ſervant, *arm'd* againſt ſuch coverture,
Reported unto all, that he was ſure
A gentleman of high regard. *Spenſer.*

(2.)* *To* ARM. *v. n.* To take arms; to be fitted with arms.—

Think we king Harry ſtrong;
And, princes, look your ſtrongly *arm* to meet him. *Shakeſp.*

(3.) *To* ARM A SHOT, in gunnery, to roll oakham, rope-yarn, or old rags about the end of the iron bar which paſſes through the ſhot.

ARMACALES, ALMARCHUR, or NAARMALCHA, a river of Babylon, called alſo *Foſſa Regia*, or the *Royal Trench*, by Polybius; and the *Royal River* by Ptolemy. It was a cut made by Nebuchadnezzar, from the Euphrates, which naturally divides into two channels, one paſſing through Babylon, the other through Seleucia, and then falls into the Tigris. This factitious channel between theſe two is the Royal River; which mixes with the Tigris, below Seleucia, at Apamea.

(1.)* ARMADA. *n. ſ.* [Span. a fleet of war.] An armament for ſea; a fleet of war. It is often erroneouſly ſpelt *armado*.—

So by a roaring tempeſt on the flood,
A whole *armada* of collected ſail
Is ſcatter'd and disjoin'd from fellowſhip. *Shak.*

(2.) ARMADA, ACCOUNT OF THE SPANISH. The armada which attempted to invade England in the time of Queen Elizabeth, is famous in hiſtory — This armada, to which the Spaniards, in confidence of ſucceſs, gave the name of *Invincible*, conſiſted of 150 ſhips, moſt of which were greatly ſuperior in ſtrength and ſize to any that had been ſeen before. It had on board near 20,000 ſoldiers and 8000 ſailors, beſides 2000 volunteers of the moſt diſtinguiſhed families in Spain. It carried 2650 great guns, was victualled for half a year, and contained ſuch a quantity of military ſtores, as only the Spaniſh monarch, enriched by the treaſures of the Indies and America, could ſupply. The troops on board were to be joined by 34,000 more which the Duke of Parma had aſſembled in the neighbourhood of Nieuport and Dunkirk.—For tranſporting theſe, he had, with incredible labour, provided a great number of flat-bottomed veſſels, and had brought ſailors to navigate them from the towns in the Baltic. Moſt of theſe veſſels had been built at Antwerp; and as he durſt not venture to bring them by ſea to Nieuport, leſt they ſhould have been intercepted by the Dutch, he was obliged to ſend them along the Scheldt to Ghent, from Ghent to Bruges by the canal which joins theſe towns, and from Bruges to Nieuport by a new canal which he dug on purpoſe. This laborious undertaking was already finiſhed, and the Duke now waited for the arrival of the Spaniſh fleet; hoping, that as ſoon as it ſhould approach, the Dutch and Engliſh ſhips which cruiſed upon the coaſt would retire. When the news reached England, terror and conſternation ſeized the inhabitants. A fleet of not above 30 ſhips of war, and thoſe very ſmall in compariſon, was all that was to oppoſe it by ſea. All the commercial towns of England, however, were required to furniſh ſhips for reinforcing this ſmall navy. The citizens of London, inſtead of 15 veſſels, which they were commanded to equip, voluntarily fitted out double the number; and the gentry and nobility equipped 43 ſhips at their own charge.—Lord Howard of Effingham was admiral; and under him ſerved Drake, Hawkins, and Frobeſher, all renowned ſeamen of courage and capacity.—The principal fleet was ſtationed at Plymouth. A ſmaller ſquadron, conſiſting of 40 veſſels, Engliſh and Flemiſh, was commanded by Lord Seymour, ſecond ſon of protector Somerſet, and lay off Dunkirk in order to intercept the Duke of Parma.—The land forces of England were more numerous than thoſe of the enemy, but inferior in diſcipline and experience. An army of 20,000 men was diſpoſed in different bodies along the ſouth coaſt, with orders to retire backwards and waſte the country, if they could not prevent the Spaniards from landing; 22,000 foot and 1000 horſe, under the command of the Earl of Leiceſter, were ſtationed at Tilbury, in order to defend the capital; and the principal army, conſiſting of 34,000 foot and 2000 horſe, commanded by Lord Hunſdon, was reſerved for guarding the Queen's perſon, and appointed to march whitherſoever the enemy ſhould appear. Theſe armies, though all the Spaniſh forces had been able to land, would poſſibly have been ſufficient to have protected the liberties of their country. But as the fate of England, in that event much depended on the iſſue of a ſingle battle, all men of reflection entertained the moſt ſerious apprehenſions of the ſhock of at leaſt 50,000 veterans, commanded by ſo conſummate a general as the Duke of Parma. The Queen alone was undaunted. She iſſued all her orders with tranquillity, animated her people to a ſteady reſiſtance, and employed every reſource which either her domeſtic ſituation or her foreign alliances could afford. She even appeared on horſeback in the camp at Tilbury; and riding through the lines, diſcovered a cheerful and animated countenance, exhorted the ſoldiers to remember their duty to their country and their religion, and profeſſed her intention, though a woman, to lead them herſelf into the field againſt the enemy, and rather periſh in battle than ſurvive the ruin and ſlavery of her people. "I know (ſaid ſhe, intrepidly) I have but the weak and feeble arm of a woman; but I have the heart of a king, and of a king of England too!" The heroic ſpirit of Elizabeth communicated itſelf to the army, and every man reſolved to die rather than deſert his ſtation.

(3.) ARMADA, HISTORY OF THE, FROM ITS SAILING. The Spaniſh armada was ready in the beginning of May; but its ſailing was retarded by the deaths of the admiral and vice-admiral. The command of the expedition was then given to the Duke of Medina Sidonia, a man entirely unexperienced in ſea affairs. This promotion, in like

meaſure, ſerved to fruſtrate the deſign, which was alſo rendered leſs ſucceſsful by other accidents. Next day after leaving the port of Liſbon, the armada met with a violent tempeſt, which ſunk ſome of the ſmalleſt of their ſhipping, and obliged the fleet to put back into the harbour. After ſome time ſpent in refitting, they put again to ſea. Being deſcried by Fleming, a Scottiſh pirate, he immediately informed the Engliſh admiral of their approach. Effingham had juſt time to get out of port, when he ſaw the Spaniſh armada coming *full ſail* towards him, diſpoſed in the form of a creſcent, and ſtretching to the diſtance of 7 miles from the extremity of one diviſion to that of the other. The Engliſh admiral, conſidering that the Spaniards would be much ſuperior to him in cloſe fight, by the ſize of their ſhips and the number of their troops, he wiſely reſolved to content himſelf with haraſſing them in their voyage, and with watching attentively all the advantages which might be derived from ſtorms, croſs winds, and ſuch like fortuitous accidents. He ſoon diſcerned a favourable opportunity of attacking the vice-admiral Recaldo. This he did in perſon; and on that occaſion diſplayed ſo much dexterity in working his ſhip, and in loading and firing his guns, as greatly alarmed the Spaniards for Recaldo's fate. From that time they kept much cloſer to one another; notwithſtanding which, the Engliſh on the ſame day attacked one of the largeſt galeaſſes. Other Spaniſh ſhips came up to her relief; but in their hurry one of the principal galleons, which had a great part of their treaſure on board, ran foul of another ſhip, and had one of her maſts broken. In conſequence of this misfortune ſhe fell behind, and was taken by Sir Francis Drake; who on the ſame day took another capital ſhip, which had been accidentally ſet on fire. Several other rencounters happened, in all of which the Engliſh proved victorious, through the great advantage which they derived from the lightneſs of their ſhips, and the dexterity of the ſailors. The Spaniards did not ſufficiently underſtand nautical mechanics, to avail themſelves of the unuſual magnitude of their ſhips. The Engliſh ſailed round them, approached, and retired, with a velocity that amazed them, and did immenſe execution with their cannon; for while every ſhot of theirs proved effectual, their ſhips ſuffered very little damage from the enemy, whoſe guns being planted too high, generally ſpent their force in air. The Spaniards, however, ſtill continued to advance till they came oppoſite to Calais; where the Duke de Medina, having ordered them to caſt anchor, ſent information to the Duke of Parma of his arrival, and intreated him to haſten the imbarkation of his forces. Farneſe accordingly began to put his troops on board; but at the ſame time informed Medina, that the veſſels which he had prepared were proper only for tranſporting the troops, but were utterly unfit for fighting; and for this reaſon, till the armada were brought ſtill nearer, and the coaſt cleared of the Dutch ſhips which had blocked up Nieuport and Dunkirk, he could not ſtir, without expoſing his army to certain ruin, the conſequence of which would probably be the entire loſs of the Netherlands. In compliance with his requeſt, the armada was ordered to advance; and it had arrived within ſight of Dunkirk, between the Engliſh fleet on the one hand, and the Dutch on the other, when a ſudden calm put a ſtop to all its motions.

(4.) ARMADA, TOTAL DESTRUCTION OF THE. In this becalmed ſituation the three fleets remained for one whole day. About the middle of the night a breeze ſprung up; and Lord Howard had recourſe to an expedient which had been happily deviſed on the day before. Having filled eight ſhips with pitch, ſulphur, and other combuſtible materials, he ſet fire to them, and ſent them before the wind againſt the different diviſions of the Spaniſh fleet. When the Spaniards beheld theſe ſhips in flames approaching towards them, it brought to their remembrance the havock which had been made by the fire-ſhips employed againſt the Duke of Parma's bridge at the ſiege of Antwerp. The darkneſs of the night increaſed the terror with which their imaginations were overwhelmed, and the panic flew from one end of the fleet to the other. Each crew, anxious only for their own preſervation, thought of nothing but how to eſcape the preſent danger. Some of them took time to weigh their anchors, but others cut their cables, and ſuffered their ſhips to drive with blind precipitation, without conſidering whether they did not thereby expoſe themſelves to a greater danger than that which they were ſo ſolicitous to avoid. In this confuſion the ſhips ran foul of one another: the ſhock was dreadful, and ſeveral of them received ſo much damage as to be rendered unfit for future uſe. When day light returned Lord Howard had the ſatisfaction to perceive that his ſtratagem had fully produced the deſired effect. The enemy were ſtill in extreme diſorder, and their ſhips widely ſeparated and diſperſed. His fleet had lately received a great augmentation by the ſhips fitted out by the nobility and gentry, and by thoſe under Lord Seymour, who had left Juſtin de Naſſau as a one ſufficient to guard the coaſt of Flanders. Being bravely ſeconded by Sir Francis Drake and all the other officers, he made haſte to improve the advantage which was now preſented to him, and attacked the enemy in different quarters at the ſame time with the utmoſt impetuoſity and ardour. The engagement began at four in the morning, and laſted till ſix at night. The Spaniards diſplayed in every rencounter the moſt intrepid bravery; but, from the cauſes already mentioned, they did very little execution againſt the Engliſh, while many of their own ſhips were greatly damaged, and twelve of the largeſt were either run aground, or ſunk, or compelled to ſurrender. It was now evident that the purpoſe of the armada was utterly fruſtrated. The Spaniſh admiral, after many unſucceſsful rencounters, prepared therefore to make his way home; but as the winds were contrary to his return through the Channel, he reſolved to take the circuit of the iſland. The Engliſh fleet followed him for ſome time; and had not their ammunition fallen ſhort, they had obliged the armada to ſurrender at diſcretion. Such a concluſion of that vain-glorious enterprize would have been truly illuſtrious to the Engliſh, but the event was ſcarce leſs fatal to the Spaniards. The armada was attacked by a violent ſtorm in paſſing the Orkneys; and

and the ships, having already lost their anchors, were obliged to keep at sea, while the mariners, unaccustomed to hardships, and unable to manage such unwieldy vessels, allowed them to drive on the western isles of Scotland, or on the coast of Ireland, where they were miserably wrecked. Not one half of the fleet returned to Spain, and a still smaller proportion of the soldiers and seamen. Queen Elizabeth ordered medals to be struck on the occasion with this motto—AFFLAVIT DEUS ET DISSIPANTUR.

ARMADABAD. See AMADABAT.

ARMA DARE, to give arms, in some ancient charters, signifies to dub, or make a knight.

ARMA DEPONERE, to lay down arms, was a punishment anciently enjoined when a man had committed an offence.

ARMADILLA, in the Spanish American navy, denotes a squadron of men of war, to the number of 6 or 8, from 24 to 50 pieces of cannon, which the king maintains, to prevent foreigners from trading with the Spaniards and the Indians, both in time of war and peace. The vessels of this armadilla are commonly called *guarda costas*. They have even power to take all Spanish merchant-ships they meet with on the coasts, that have not licences from the king. The South sea has its armadilla as well as the North sea. The ordinary rendezvous of the former are at Calao, a port of Lima; that of the latter at Carthagena.

(1.) * ARMADILLO. *n. s.* [Spanish.] A four-footed animal of Brazil, as big as a cat, with a snout like a hog, a tail like a lizard, and feet like a hedge-hog. He is armed all over with hard scales like armour, whence he takes his name, and retires under them like the tortoise. He lives in holes, or in the water, being of the amphibious kind. His scales are of a bony or cartilaginous substance; but they are easily pierced. This animal hides himself a third part of the year under ground. He feeds upon roots, sugar-canes, fruits, and poultry. When he is caught, he draws up his feet and head to his belly, and rolls himself up in a ball, which the strongest hand cannot open; and he must be brought near the fire before he will shew his nose. His flesh is white, fat, tender, and more delicate than that of a sucking pig. *Trevoux.*

(2.) ARMADILLO, in zoology, a synonime of the dasypus. See DASYPUS.

ARMADO. See ARMADA, § 1.

ARMAGEDDON, the Hebrew name given to the place where it is thought the Popish and Mahometan troops shall be destroyed under the sixth vial. Its name alludes to Megiddo, where Barak, with 10,000 dispirited, and almost unarmed men, entirely routed, and almost wholly slew, the mighty host of the Canaanites, and may be interpreted *the destruction of troops*. Whether this shall be in Italy, or in Judea, or elsewhere, we dare not positively determine, Rev. xvi. 13, 14. The present appearance of the world, whether Pagan, Catholic, or Christian, has suggested another view of the meaning of the text. The word *Armageddon*, literally signifies *the armies of the subtile one*. In Rev. xvi. 13. we find the operation of these unclean spirits mentioned; they are called the spirits of devils; and as they proceed from the mouth of the dragon, beast, and false prophet, the whole world of the ungodly are included, and therefore their influence is universal and "they go forth into the *whole world*." Ver. 16. we have the effect of their operation; they are the means by which men are gathered together to the battle of the great day of God Almighty; they are gathered into *one place*, which seems figuratively to import, *one mind*; and, when collected, they become the *armies of Satan* to fight in his cause. We pretend not to explain, *in a positive manner*, this prophetical language; the following ideas are hinted, for those readers we approve to follow out more fully, by comparing other parts of scripture on the subject; those, who disapprove, will certainly forgive the insertion of them. We are the more induced to hazard what is now offered, because as prophecies are best explained when fulfilled, so the present day seems to be that in which the fulfilment of this prophecy is to be looked for: it immediately precedes the *destruction* of Antichrist; his *decay*, as men confess, is very far advanced. May we not attempt to elucidate this prophecy by a simple question, viz. Is there any one *characteristic system* of the present day, with which mankind in all nations, ranks, and professions, seem universally tinctured, and which seems to be more and more gaining ground? Yes, Infidelity. The diffusion of knowledge, both as to things spiritual, by the circulation of the scriptures in the languages of the nations; and as to things temporal, by the art of printing, and various concomitant circumstances, tended to unfold the priestcraft, by which men had for many ages been kept in bondage. In this century, in particular, not only the mummery of the church of Rome, but the absurdities of her daughters have been exposed.—Mankind have been instructed to exercise their *reason*; but, forgetting that she was calculated only for this world, for illuminating and directing man, wherever his natural eye pervades; they have foolishly translated the throne of this earthly *goddess* to heaven; where revelation can only illuminate our darkened eyes. Fancifully dreaming that an AGE OF REASON will realize the *golden age* of the heathen, men are dancing after the wild footsteps of their goddess. Turks, Jews, Mahometans, are each, in their degree, following those who lately bore the name of Christians. The contagion is spreading. The effect of infidelity is to fight with God Almighty. Infidelity, therefore, seems to be the last enemy who shall be destroyed. Such, we humbly apprehend to be the meaning of the battle of Armageddon.

(1.) ARMAGH, a county of Ireland, bounded by Louth on the S. Lough-neagh, on the N. Tyrone and Monaghan, on the W. and Down, in part, on the E. from which it is separated by the river Newry. It is in length 32 miles, in breadth 17; and is divided into five baronies, containing about 170,620 acres. The climate and soil are good, especially the latter, which is said to be the richest in Ireland; only there is a certain tract of it called the *Fewes*, that is, *hilly* and *barren*. It sent 6 members to parliament, viz. two for the

bity of Armagh, two for the county, and two for the borough of Charlemont. Its trade in linen is eſtimated at L. 291,900 Sterling annually.

(2.) ARMAGH, a town of Ireland, which gives name to the county, (See N° 1.) ſeated near the river Kalin, about 30 miles S. of Londonderry, and 63 N. of Dublin. It is the ſee of the primate of all Ireland, and is ſaid to have been founded by St Patrick in the fifth century. In 1142, it was conſtituted an archbiſhopric, together with Dublin, Caſhel, and Tuam, by cardinal Papyreo, with the conſent of the king, dukes, biſhops, abbots, and ſtates of Ireland. This Papyreo was ſent into Ireland by Pope Eugenius, to reform the abuſes that had crept into the church diſcipline of that country. Armagh had anciently a famous monaſtery built by St Columbo, or Columbanus, about the year 610. The cathedral was often burnt, but as often rebuilt and enlarged, and particularly by Patrick Scanlain, about 1262. His ſucceſſor Nicholas, ſon of Moliſſa, beſides books, rich eccleſiaſtical veſtments, and other things, beſtowed on it an annual penſion of 20 merks; and he appropriated to his ſee the manor of Dromyſkin. He died in 1303. This town was firſt ſubjected to the Engliſh by John de Courcy; but afterwards entirely deſtroyed by Tir Oen, or O'Neal, in Queen Elizabeth's time. It was recovered, rebuilt, and garriſoned by the Engliſh. The ſee of Armagh, by an extent returned in the 15th of James I. is valued at L. 400 Sterling *per annum*, and pays ſo much firſt fruits to this day. It is reputed to be worth annually L. 8000. The chapter of Armagh is compoſed of five dignitaries and four prebendaries, who have voices in every capitular act. The dignitaries are thus ranked, viz. a dean, chanter, chancellor, treaſurer, and arch-deacon. There are alſo eight vicars choral, and an organiſt, attendant on the ſervice of the cathedral. The vicars choral were anciently fewer; and of the number only one prieſt. Primate Marſh added another prieſt, but without increaſing the number of vicars. In the year 1720, Primate Lindſay obtained a new charter for enlarging the number of the ſaid vicars to eight, and laid out upwards of L. 4000 on a purchaſe, in augmentation of the eſtate of the choir.

ARMAGHBREGAH, a village of Ireland in the county of Meath.

ARMAGNAC, a ci-devant province of Guienne in France, 55 miles in length and 40 in breadth; Auch was the capital town. It now forms part of the department of Gers. It is fertile in corn and wine, and carries on a conſiderable trade in brandy, wool, and bonchretien pears, which are excellent.

ARMA LIBERA, [free arms, Lat.] in ancient law, a ſword and lance given to a ſervant, when he was made free.

ARMAMAR, a town of Portugal, in Beira.

ARMAMAXI, [from *arma*, Lat. arms, and ἅμαξα, Gr. a carriage,] in antiquity, a kind of Scythian chariots or carriages, compoſed of two wheels, variouſly adorned with crowns, ſhields, breaſt plates, and other ſpoils, carried in proceſſion after the images of the gods and great men.

(1.) * ARMAMENT. *n. ſ.* [*armamentum*, Lat.] A force equipped for war; generally uſed of a naval force.

(2.) ARMAMENT is alſo uſed for a ſtorehouſe for arms.

* ARMAMENTARY. *n. ſ.* [*armamentarium*, Lat.] An armoury; a magazine or arſenal of warlike implements *Dict.*

ARMA MOLUTA, were ſharp weapons: Fleta calls them *arma emolita*.

ARMA MUTARE, i. e. to change arms, was a ceremony anciently uſed to confirm a league.

* ARMAN. *n. ſ.* A confection for reſtoring appetite in horſes. *Dict.*

ARMANCON, a river of France, in Champagne.

ARMANTHWAITE, the name of 3 villages, viz. 1. in Cumberland, near the Eden, between Kirk-Oſwald and Corby-Caſtle: 2. in ditto, adjoining Ouſe-bridge, at the foot of Baſſingthwaite water. It has a fine view of this beautiful lake; of the romantic hills of Withop on the right, and the lofty Skiddaw on the left; and the diſtant hills of Borrodaile and Keſwick terminate the proſpect: 3. in Yorkſhire, near Danby.

ARMA REVERSATA, inverted arms, was a puniſhment when a man was convicted of felony.

ARMARIUM UNGUENTUM, a ſympathetic ointment, by which, in the days of credulity, wounds were believed to be cured, however diſtant the patient, by only anointing the weapons!

ARMATIUM, in ancient phyſic, a defenſive kind of collyrium, of great value in removing aſperites of the eye lids. Its chief ingredients were *æs uſtum*, gum ammoniac, and the roots of the tree *thus*. The preparation is deſcribed by Galen, Aetius, Paulus, and Scribonius.

(1.) ARMATURA, armour. See ARMATURE.

(2.) ARMATURA, in the ancient military art, a kind of exerciſe, performed with miſſive weapons, as darts, ſpears, arrows, and the like. It was practiſed with great diligence among the Romans: they had their *campidoctores*, on purpoſe to inſtruct the *tyrones*, or young ſoldiers in it. Under it were included the throwing of the ſpear or javelin, ſhooting with bows and arrows, &c.

(3.) ARMATURA, uſed perſonally, was an appellation given to the ſoldiers who were light armed; as well as thoſe in the emperor's retinue. Of theſe we find two ſchools, mentioned in the *Notitia imperii*, called the *armaturæ ſeniores* and *armaturæ juniores*. Their commander was entitled *tribunus armaturarum*.

* ARMATURE. *n. ſ* [*armatura*, Lat.] 1. Armour; ſomething to defend the body from hurt. —Others ſhould be armed with hard ſhells; others with prickles; the reſt that have no ſuch *armature*, ſhould be endued with great ſwiftneſs and pernicity. *Ray on the Creation.* 2. Offenſive weapons: leſs properly.—The double *armature* is a more deſtructive engine than the tumultuary weapon. *Decay of Piety.*

ARMDALE, a village of Scotland, in the county of Sutherland, and pariſh of Far.

ARMDALE BAY, a bay on the coaſt of the county of Sutherland in Scotland.

ARMEBOTH, a village of Cumberland, near the river Thurlemyre and Legburth water.

(1.) * ARMED. *adj.* [in heraldry.] Is uſed in

reſpect of beaſts and birds of prey, when their teeth, horns, feet, beak, talons, or tuſks, are of a different colour from the reſt; as, he bears a cock or a falcon *armed*, or. *Chalmers*.

(2.) ARMED, in the ſea language. A croſs bar ſhot is ſaid to be armed, when ſome rope yarn or the like is rolled about the end of the iron bar, which runs through the ſhot.

* ARMED CHAIR. *n. ſ.* [from *armed* and *chair*.] An elbow chair, or a chair with reſts for the arms.

ARMED KNIGHT, a rock at the Land's End in the county of Cornwall.

ARMED LOADSTONE. See ARM, N° 6.

ARMED SHIP, a veſſel occaſionally taken into the ſervice of the government in time of war, and employed to guard ſome particular coaſt, or attend on a fleet. She is therefore armed and equipped in all reſpects like a ſhip of war, and commanded by an officer of the navy, who has the rank of a maſter and commander. All ſhips of this ſort are upon the eſtabliſhment of the king's ſloops, having a lieutenant, maſter, purſer, ſurgeon, &c.

ARMENA, in botany, a name given by Pliny to a kind of wild aſparagus; but the ancient Greeks have uſed the ſame word to expreſs the young ſhoots of the common aſparagus, at the time when they are eaten; and not only theſe, but the young ſprouts of the cabbage, and of all other eſculent plants.

ARMENE, or ARMINA, an ancient village of Paphlagonia. The inhabitants encompaſſed it with a wall, becauſe of the coldneſs of the place, imagining by that means to render it warmer. But this proving ineffectual, gave riſe to the proverb *Armenen muro cingere*, uſed to expreſs ſome egregious folly.

(1.) ARMENIA, a country of Aſia, anciently divided into Armenia Major and Minor. The origin of the name is not determined. The Greeks ſuppoſe it to be ſo called from one ARMENUS, who attended Jaſon in the Argonautic expedition, and afterwards ſettled in this country. Others, transforming Armenia into Aramia, derive its name from Aram the ſon of Shem, or from one of the kings of Armenia bearing that name. Bochart imagines it to be a contraction or compound of *Aar*, a Hebrew word ſignifying a "mountain," and *Mini* ſignifying "metal," and which was the name of a province of Armenia mentioned by the prophet Jeremiah.

(2.) ARMENIA, ANCIENT HISTORY OF. Armenia is ſaid to have been very early erected into a kingdom. Beroſus makes one Sytha the firſt founder of this monarchy, whoſe ſucceſſor Bardanes, he ſays, was driven out by Ninus king of Aſſyria. Plutarch mentions one Araxes king of Armenia, who in a war with the Perſians, being aſſured of ſucceſs by an oracle, provided he ſacrificed his two daughters, cauſed the two daughters of one Mieſalcus, a nobleman of his court, to be ſacrificed in their ſtead, flattering himſelf that he thereby complied with the oracle. But Mieſalcus did not fail to revenge the death of his own daughters, by putting the king's two daughters to death, and purſued himſelf ſo cloſely, that he was drowned in attempting to ſwim acroſs the Araxes, which was formerly called *Helmus*. The Armenians were afterwards ſubdued by the Medes, whom Aſtyages made them tributaries, but allowed them to be governed by their own kings. On the diſſolution of the Median empire by Cyrus, Armenia was reduced to the form of a province, and they were governed by Perſian prefects or lieutenants. On the deſtruction of the Perſian empire by Alexander the Great, Armenia fell into the hands of the Macedonians. Upon the death of that prince, it fell to Seleucus, and continued ſubject to Syria, till the beginning of the reign of Antiochus the Great. This prince having appointed two prefects called *Zadriades* and *Artoxias* to govern Armenia, they excited the people to revolt, and cauſed themſelves to be proclaimed kings of the provinces over which they preſided. Antiochus being then very young, they were attended with ſucceſs beyond their expectation; which encouraged them to attempt the largement of their territories. Accordingly, dividing the neighbouring countries, they took from the Medes the provinces of Caſpiana, Phauſiana and Baſoropida; from the Iberians, Chorzena, Gogorena on the other ſide of the Cyrus; from the Chalybes and Moſſynæci, the provinces of Pareneta and Herezena, which bordered on Armenia Minor. On this occaſion, the diviſion of the kingdom into Armenia Major and Minor took place. Artaxias became king of Armenia Major, and Zadriades of Armenia Minor; and this diſtinction ſubſiſts even at this day.

(3.) ARMENIA MAJOR according to Strabo was bounded on the S. by mount Taurus, which ſeparated it from Meſopotamia; on the E. by the two Medias; on the N. by Iberia and Albania, or rather that part of mount Caucaſus which ſurrounds them both; and on the W. by Armenia Minor, on the mountains Paryadres, ſome Pontic nations, and the Euphrates. The moſt conſiderable cities were Artaxata, Tigranocerta, and Theodoſiopolis.

(4.) ARMENIA MAJOR, ANCIENT HISTORY OF. By whom Artaxias was ſucceeded is not known, neither have we any account of the tranſactions of his reign, farther than that Antiochus led a powerful army againſt him and Zadriades, but without being able to recover a ſingle province. Upon this he concluded a peace, deſigning to fall upon them at a proper opportunity: but they having entered into alliance with the Romans, by that means ſecured themſelves in the poſſeſſion of their kingdom. After this Artaxias was defeated and taken priſoner by Antiochus Epiphanes; but he was afterwards reſtored to his kingdom. From this time we meet with a chaſm in the Armenian hiſtory for 70 years; during which all we know is, that Tigranes, the king's ſon, was delivered up as an hoſtage to the Parthians; from which it is plain, that the Armenians had been carried on an unſucceſsful war with that nation. On the news of his father's death, however, the Parthians ſet the young king at liberty, having firſt obliged him to give up a conſiderable part of the kingdom by way of ranſom. Tigranes, being thus reſtored to his father's kingdom, was prevailed upon in the beginning of his reign to enter into an alliance with Mithridates Eupator againſt the Ro-

mans, whoſe powers began to give jealouſy to all the princes of Aſia. One of the articles of the treaty was, that Mithridates ſhould have the cities and conquered countries, and Tigranes the captives and plunder. In conſequence of this, Tigranes was to invade Cappadocia, which he had lately been obliged, by a decree of the ſenate of Rome, to give up to Ariobarzanes. But before either of the princes took the field, a marriage was ſolemnized with all poſſible magnificence between Tigranes and Cleopatra the daughter of Mithridates. Immediately after the nuptials, Tigranes ſet out on his intended expedition; and Ariobarzanes, on the firſt news of his march, abandoned his kingdom and fled to Rome. Thus Tigranes, without fighting a ſtroke, enriched himſelf with the booty, and then proclaimed Ariarathes, Mithridates's ſon, king of Cappadocia, to the univerſal ſatisfaction of the people. In the mean time the Syrians, being haraſſed with a long and inteſtine war of the Seleucidæ, invited Tigranes to come and take poſſeſſion of their country; which he accordingly did, and kept it for 18 years, till he was driven out by Pompey, and Syria reduced to the form of a Roman province. Encouraged by this ſucceſs, he next invaded Armenia Minor; defeated and killed king Artanes, who oppoſed him with a conſiderable army; and in one campaign made himſelf maſter of the whole kingdom. From Armenia Minor he marched againſt the Aſiatic Greeks, the Adiabenians, the Aſſyrians, and the Gordians, carrying all before him, and obliging the people wherever he came to acknowledge him ſovereign. From this ſecond expedition he returned home loaded with booty, which he ſoon after increaſed by the ſpoils of Cappadocia, invading that kingdom a ſecond time at the inſtance of Mithridates, who had been obliged by the Romans to withdraw his forces from thence. From Cappadocia Tigranes, beſides other booty, brought back into Armenia, no fewer than 300,000 captives, having ſurrounded the country with his numerous forces in ſuch a manner that none could eſcape. Theſe, together with the priſoners he had taken in his two firſt expeditions, he employed in building the city of Tigranocerta, which they afterwards peopled. In the mean time Mithridates, who had concluded a peace with the Romans for no other end than to gain time, ſent a ſolemn embaſſy to Tigranes, inviting him to enter into a ſecond alliance againſt the common enemy. This he at firſt declined; but in the end was prevailed upon by his wife Cleopatra to ſend him conſiderable ſupplies, though he never came heartily into the war, not caring to provoke the Romans, who on their part kept fair with him, taking no notice for the preſent of the ſupplies he had ſent Mithridates. That unfortunate prince being ſoon after defeated by Lucullus, was forced to fly for ſhelter into Armenia, where he met with a very cold reception from his ſon-in-law, who would neither ſee him, treat with him, nor own him as his relation: however, he promiſed to protect his perſon, and allowed him in one of his caſtles a princely retinue, and a table ſuitable to his former condition. Though this total overthrow of Mithridates might have opened the eyes of Tigranes, and made him oppoſe with all his might the growing power of the Romans, he fooliſhly left them to finiſh their conqueſt of Pontus, while he marched at the head of a very numerous army againſt the Parthians, with a deſign to recover from them the dominions they had formerly extorted from him before they ſet him at liberty. Theſe he eaſily retook; and, not ſatisfied with what formerly belonged to him, he added to them all Meſopotamia, the countries that lay about Ninus and Arbela, and the fruitful province of Migdonia; the Parthians, though at that time a mighty people, flying every where before him. From Meſopotamia Tigranes marched into Syria to quell a rebellion which had been raiſed by Cleopatra ſurnamed *Selene*; who, after the death of her huſband Antiochus Pius, reigned jointly with her ſons in that part of Syria, which Tigranes had not ſeized on. The malecontents were quickly reduced; and the queen herſelf was taken priſoner, and confined to the caſtle of Seleucia, where ſhe was ſoon after put to death by the king's order. From Syria Tigranes paſſed into Phœnice, which he ſubdued either entirely or in great part, ſpreading far and wide the terror of his arms, inſomuch that all the princes of Aſia, except thoſe who were in allaince with the Romans, either in perſon, or by their deputies, ſubmitted and paid homage to the conqueror. Tigranes, having now ſubdued all Syria to the borders of Egypt, and being elated with a long courſe of victories and proſperous events, began to look upon himſelf as far above the level of other crowned heads. He aſſumed the title of *king of kings*, and had many kings waiting upon him as menial ſervants. He never appeared on horſeback, without the attendance of four kings dreſſed in livery, who run by his horſe; and when he gave anſwers to the nations that applied to him, the ambaſſadors ſtood on either ſide the throne with their hands claſped, that attitude being of all others then accounted among the orientals the greateſt acknowledgement of vaſſalage and ſervitude. In the midſt of all this haughtineſs, however, he was unexpectedly viſited by an ambaſſador from Lucullus, the Roman general, who, without any ceremony, told him, that he came to demand Mithridates king of Pontus, who had taken refuge in his dominions, and, in caſe of his refuſal, to declare war againſt him. Notwithſtanding his high opinion of himſelf, Tigranes returned a mild anſwer to this meſſage: in which, however, he refuſed to deliver up his father-in-law; and being highly provoked at Lucullus, for not giving him the title of *king of kings* in his letter, he did not ſo much as beſtow upon him the title of *general* in his anſwer. In the mean time, being informed, that Zarbienus king of the Gordians had entered into a private alliance with the Romans, he put him, his wife, and children, to death; and then, returning into Armenia, received with the greateſt pomp imaginable, his father-in-law, Mithridates, whom to that time he had not admitted into his preſence, though he had reſided a year and eight months in his dominions. They had ſeveral private conferences; and at laſt Mithridates was ſent back to Pontus, with 10,000 horſe, to raiſe there what diſturbances he

could. Lucullus, on the other hand, hearing the king's reſolution to protect Mithridates, immediately began his march for Armenia, at the head of only two legions of foot, and 3000 horſe, having left 6000 men in Pontus, to keep that country quiet. Having paſſed the Euphrates without oppoſition, he detached two parties; one to beſiege a city where he heard that Tigranes's treaſure and concubines were kept; and the other under Sextilius, to block up Tigranocerta, in order to draw the king to a battle. But Tigranes, after having put to death the ſcout that brought him the firſt intelligence of the approach of the Romans, made towards Mount Taurus, which he had appointed for the place of the general rendezvous. The Roman general then diſpatched Muræna in purſuit of the king; who having overtaken him in a narrow paſs, defeated him, and, beſides all the baggage, carried off a great many priſoners; the king himſelf having fled in the beginning of the ſkirmiſh. After this, he ſent out ſeveral parties to ſcour the country, in order to prevent the innumerable forces of Tigranes from joining into one body. This, however, he was not able to effect; Tigranes was joined by ſuch numbers of Gordians, Medes, Adiabenians, Iberians, &c. that, before he left Mount Taurus, his army conſiſted, according to Plutarch, of 150,000 foot, armed cap-a-pee, 35,000 pioneers, 20,000 archers and ſlingers, and 55,000 horſe.—Lucullus was ſo far from being diſmayed at this formidable army, that the only fear he had was leſt the king ſhould follow the advice of Mithridates, which was not to engage the Romans, but, by ravaging the country, diſtreſs them for want of proviſions. In order to draw him to a battle, therefore, he formed the ſiege of Tigranocerta, imagining that Tigranes would never ſuffer that fine city to be taken, without making any attempt to relieve it. The event fully anſwered his expectations; Tigranes having called a council of war, it was unanimouſly reſolved to attack the Romans: and Taxilis, whom Mithridates ſent to diſſuade the king from venturing a battle, was in danger of loſing his head on account of the advice he gave. The Roman general, finding Tigranes diſpoſed to come to an engagement, left Muræna with 6000 men to carry on the ſiege, while he himſelf marched againſt the king's vaſt army with only 10,000 men, according to ſome, and the higheſt computations make them no more than 18,000. The Romans were at firſt greatly diſheartened: but being encouraged by Lucullus, they immediately broke the Armenian army, who betook themſelves to flight, almoſt at the firſt onſet. The Romans purſued till night, making a moſt terrible ſlaughter. Plutarch informs us, that of the Armenians 100,000 foot, were killed, and that very few of the cavalry eſcaped; whereas of the Romans only 5 men were killed, and 100 wounded. Antiochus the philoſopher, mentioning this battle, ſays, that the ſun never beheld the like; and Livy, that the Romans never fought at ſuch a diſadvantage; the conquerors not amounting to one twentieth part of the conquered. Tigranes, in his flight having met with his ſon in as forlorn a condition as himſelf, reſigned to him his royal robes and diadem, deſiring him to ſhift for himſelf, and ſave thoſe royal enſigns. The young prince delivered them to a truſty friend, who, being taken by the Romans, conſigned them to Lucullus. While Tigranes was making his eſcape, he was met by Mithridates, who was marching to his aſſiſtance, at the head of a conſiderable army. The king of Pontus cheered up his ſon-in-law, as well as he could, and encouraged him to continue the war: adviſing him, inſtead of fruitleſsly bewailing the preſent diſaſter, to rally his troops, raiſe new ſupplies, and renew the war, not queſtioning but that in another campaign, he might repair all the loſſes he had ſuſtained: but, while the two kings were conſulting upon theſe matters, Lucullus made himſelf maſter of Tigranocerta. From this city, he marched into the ſmall kingdom of Gordyene, where he celebrated, with the utmoſt pomp, the obſequies of king Zabienus, whom Tigranes had put to death, lighting the funeral pile with his own hands. In this kingdom, beſides immenſe ſums of gold and ſilver, he met with ſuch ſtore of proviſions as enabled him to carry on the war without putting the republic to any charge. The two kings, having levied new forces, appointed their troops to rendezvous in the ſpacious plains on the other ſide of Mount Taurus: whereupon Lucullus, leaving Gordyene, and paſſing by Mount Taurus, encamped cloſe by the enemy. Several ſkirmiſhes happened for ſome time between the two armies, without any conſiderable advantage. But Lucullus could by no means draw them to a general engagement. Upon this he decamped, as if he deſigned to march to Artaxata, and lay ſiege to that place, where Tigranes had left his wife and children, with great part of his treaſures. He had ſcarce formed his camp, when the enemy appeared, and ſat down cloſe by him. Lucullus did not allow them to fortify their camp, but immediately attacked them, and having put them to flight after a faint reſiſtance, purſued them all night with great ſlaughter, took moſt of the chief officers priſoners, and returned the next day, loaded with booty. The Roman ſoldiers now, finding the cold very ſevere, though it was no later in the year than the autumnal equinox, requeſted their general to allow them to retire into winter quarters. This requeſt he rejected with indignation; upon which they mutinied. Lucullus did all he could to perſuade them to continue in their duty; and prevailed ſo far that they conſented to lay ſiege to Niſibis in hope of booty. This place they took; and Lucullus, to the great ſatisfaction of his troops, took up his winter quarters there. The next year, however, his forces again mutined, accuſing him of amaſſing immenſe wealth for himſelf; and throwing their empty purſes at his feet, told him, that as he enriched himſelf alone, he might carry on the war by himſelf. He endeavoured to appeaſe them as much as poſſible; but the ſedition being fomented by a party who favoured Pompey the Great, at that time aſpiring to the command of Lucullus's army, the latter found himſelf obliged to ſit ſtill and ſee Mithridates and Tigranes overrun Cappadocia, and recover all Armenia, and great part of Pontus. They would have gained much greater advantages, had not a ſon of Ti-

granes

granes taken arms againſt his father, and obliged him to divide his troops. The father and ſon coming to a pitched battle, the latter was defeated, and forced to ſave himſelf in Parthia, where he perſuaded Phrahates, king of that country, to aſſiſt him with a numerous army againſt his father. Phrahates having laid ſiege to Artaxata, Tigranes the elder was obliged to hide himſelf in the mountainous parts of his kingdom; upon which the king of Parthia returned home. Of this Tigranes the father being appriſed, he immediately abandoned the faſtneſſes of the mountains; and, falling upon his ſon at Artaxata, diſperſed the rebels with great ſlaughter; and entered his metropolis in triumph. Tigranes the ſon firſt fled to Mithridates; but finding him reduced to great ſtraits, having been overcome a few days before, with the loſs of 40,000 men, by Pompey, he went over to the Romans, and led them into Armenia againſt his father as an ally of Mithridates. Tigranes, being now quite diſpirited, and unable to make head againſt the Romans, reſolved at once to ſubmit. Accordingly he waited on Pompey in his camp, and having delivered his ſword to two lictors, proſtrated himſelf before him, and laid his diadem at his feet. Pompey, however, gave him a gracious reception, reſtored him the kingdom of Armenia, but fined him of 6000 talents for making war on the Roman people without cauſe. As the king had appealed to the Roman general, for juſtice againſt his ſon, Pompey heard both parties the next day, and made the ſon governor of Gordyene and Sophene; but the treaſures that were kept in the latter, he adjudged to the father, becauſe without them he could not pay the fine. The ſon, being thus diſappointed, endeavoured firſt to make his eſcape, and afterwards, by private meſſengers, ſolicited the inhabitants not to deliver up the treaſures to his father. This being taken very much amiſs by Pompey, he cauſed him to be kept in irons; and even then he found means to ſtir up Phrahates king of Parthia, whoſe daughter he had married, againſt the Romans, and to form a conſpiracy againſt his father's life; whereupon Pompey ſent him in chains to Rome, where he was kept priſoner in the houſe of L. Flavius a ſenator, till the tribuneſhip of P. Clodius, who, being bribed with a large ſum of money, ſet him at liberty in ſpite of Pompey and the ſenate. Tigranes, now thoroughly humbled, willingly yielded to the Romans, Cappadocia, Syria, Cilicia, and that part of Phœnice which he poſſeſſed, contenting himſelf with his paternal kingdom; and not only paid the ne laid upon him, but made large preſents to Pompey, and all the officers of his army, which procured him the title of *the friend and ally of the Roman people*. He afterwards entered into a war with Phrahates king of Parthia, by whom he was overcome, and would have been driven out of his kingdom, had not a peace been brought about by the mediation of Pompey. He ever after cultivated a ſtrict friendſhip with the Romans; inſomuch that he not only refuſed to receive Mithridates, who fled to him after he had been routed by Pompey near Mount Stella, but even offered a reward of 100 talents to any one that would kill him to death. His ſecond ſon alſo, by name Sariaſter, took up arms againſt him; but, by the aſſiſtance of the Romans, that rebellion was ſoon after quelled. He died in the 85th year of his age; and was ſucceeded by his ſon Artuaſdes, called by Joſephus, Artabazes, by Oroſius, Artabanes, and by others, Artoadiſtes. From this time, to the time of Trajan, Armenia was governed by its own kings; but as they were plainly vaſſals to the Romans, though they did not take that title till the reign of the emperor Nero, their hiſtory falls to be conſidered under that of the Romans By Trajan, the kingdom of Armenia Major was reduced to the form of a Roman province; but it ſoon recovered its liberty, and was again governed by its own kings in the reigns of Conſtantine the Great, and his ſucceſſors, to whom the kings of Armenia were feudatories.

(5.) ARMENIA MAJOR, MODERN HISTORY OF. In the reign of Juſtin II. the Saracens ſubdued Armenia, and held it till the irruption of the Turks who poſſeſſed themſelves of this kingdom, and gave it the name of *Turcomania*. The Turks, after the reduction of Armenia, invaded Perſia, and other countries ſubject to the emperors of the eaſt; which gave the Armenians an opportunity of ſhaking off the Turkiſh yoke, and ſetting up kings of their own, by whom they were governed till the country was again ſubdued by Occadan, or, as ſome ſtyle him, *Heccata*, the ſon of Cingis, and firſt cham of the Tartars. Neither was the conqueſt of Armenia by the Tartars ſo abſolute as to extirpate the race of their kings; ſeeing we read of Haithon, ſurnamed the *Armenian*, reigning ſome time after, and going in perſon to treat with Mungo, the great cham of Tartary, of the concerns of his kingdom; and in our chronicles we find mention made of Leo king of Armenia, who, in the reign of Richard II. came into England to ſue for aid againſt the Turks, by whom he had been driven from his kingdom. In A. D. 1472, Uſſan Caſſanes king of Armenia, ſucceeding to the crown of Perſia, made Armenia a province of that empire; in which ſtate it continued till 1522, when it was ſubdued by Selim II. and made a province of the Turkiſh empire. Some ſay that Selim I. reduced it on his return from Perſia, where he had gained a complete victory over the great Sophi Iſmael. But Sanſovin aſſures us, that in the reign of Selim I. who died in 1520, both the Leſſer and Greater Armenia had their own kings; and adds that Selim cauſed the head of the king of the leſſer Armenia to be cut off and ſent to Venice as a mark of his victory. We read no where elſe of any kings of Armenia after it became a province of Perſia. Be that as it will, the Turkiſh annals cited by Calviſius inform us, that Selim II. conquered Armenia in 1522, ever ſince which time it has continued ſubject to the Turks, except the eaſtern part, which ſtill belongs to the Perſians.

(6.) ARMENIA MINOR was bounded on the E. by the Euphrates; on the S. by mount Taurus, which ſeparates it from Cilicia; on the W. and N. by a long chain of mountains called in different places *Mons Scordiſus*, *Amanus*, and *Antitaurus*, by which it was ſeparated from Cappadocia. Concerning Armenia Minor we find very little recorded, except what has been already mentioned, and what

what falls under the Roman hiſtory. It was made a Roman province by Veſpaſian, continued ſo till the diviſion of the empire, when it was ſubjected to the emperors of the eaſt; and, on the decline of their power, was ſubdued firſt by the Perſians, and afterwards by the Turks, who gave it the name of *Genech*, and have kept it ever ſince.

(7.) ARMENIA, PRESENT STATE OF. This country is ſtill divided into Major and Minor, or the Greater and Leſſer Armenia. Greater Armenia comprehends what is now called *Turcomania*. It has Georgia on the N. from which it is ſeparated by high mountains; the Euphrates on the W.; Diarbeker, Curdiſtan, and Aderbijan, on the S.; and Skirvan on the E. The chief towns in that part of Armenia belonging to Turky are, Arzum the capital, near the ſprings of the Euphrates, a large city, and a great thoroughfare for the caravans between Turky and Perſia; Kara, a ſtrong city, head of the government of the ſame name; Bayazid, a republic of Hurds, near mount Ararat: Baha, another republic of the ſame: and Van or Wan, on the lake Van, the head of a government of the ſame name; with other towns of leſs note. The part of Armenia ſubject to Perſia is chiefly contained in the province of Aran, in which are ſeveral fine towns; as, Erivan or Rivan, the capital of the whole; Ganjals, one of the fineſt cities in Perſia, in the N. of the province, near the Kur; Kapan, on the S. ſide, near the Aras; beſides Nakchivan, Aſtabad Julfa, Ordabad, Baylakan or Pilkan, on the Aras; Berdah and Shilkah on the Kur. The country in general is full of mountains and valleys, lakes, and rivers; particularly the country about the three churches, near Erivan, is admirably fine, being full of rivulets, which render it extremely fruitful. Beſides great quantities of all ſorts of grain, there are fields of a prodigious extent covered with tobacco: but it is not a native of Armenia, for it all came originally from America. The reſt of the country produces rice, cotton, flax, melons, and grapes: in ſhort, there is nothing wanting but olives; which is by ſome thought to prove that the ark could not reſt on mount Ararat, becauſe the dove brought an olive branch in her mouth, and this tree never leaves a place where it once grew. It ſeems, however, to have been otherwiſe anciently; for Strabo tells us, that the olive grew in Gogarene, a province of Armenia. They get oil to burn from the ricinus, and uſe linſeed oil in the kitchen. The water-melons are as cool as ice in the hotteſt day, and melt in the mouth; the beſt are produced in the ſalt lands, near the three churches and the river Aras. After rain, the ſea ſalt lies in cryſtals upon the fields, and even crackles under the feet. About ten miles from the three churches, in the road to Teflis, there are pits or quarries of foſſile ſalt, which yield enough to ſupply all Perſia, without being exhauſted; they cut it into large pieces like ſtone, and each buffalo carries two of them; the mountain from whence it is dug is nothing but a maſs of ſalt, which appears like a rock of ſilver, when the ſun ſhines, on the places not covered with earth. This country has been remarkable for its extreme cold for the remoteſt antiquity: Sir John Chardin tells us, that he found ice in the rivulets in the mornings even of the month of July. In many places, alſo, if the inhabitants had not the convenience of water in their grounds, they would be almoſt entirely barren See ARMENIANS, § 2 and 3.

ARMENIACA. See PRUNUS.

ARMENIAN, any thing belonging to or produced in Armenia.

ARMENIAN BIBLES. See BIBLES.

(1.) * ARMENIAN BOLE. *n. ſ.* A fatty mineral kind of earth, of a pale reddiſh colour, which takes its name from the country of Armenia.

(2.) ARMENIAN BOLE. See BOLE.

(1.) * ARMENIAN STONE. *n. ſ.* A mineral ſtone or earth of a blue colour, ſpotted with green, black and yellow; anciently brought only from Armenia but now found in Germany, and in Tyrol. It bears a near reſemblance to lapis lazuli, from which it ſeems only to differ in degree of maturity; it being ſofter, and ſpeckled with green inſtead of gold. *Chambers.*

(2.) ARMENIAN STONE. See ARMENUS LAPIS.

(1.) ARMENIANS, the inhabitants of Armenia. Herodotus derives the ancient Armenians from the Phrygians, by reaſon that ſeveral Phrygian words were crept into the ancient Armenian language. But Strabo reckons them to have been originally Syrians, which Bochart looks upon as the moſt probable opinion.

(2.) ARMENIANS, CHARACTER OF THE. The Armenians are an honeſt, civil, polite people, ſcarce troubling themſelves about any thing but trade, which they carry on in moſt parts of the world, by which means they have ſpread themſelves over the eaſt, and alſo great part of Europe, and wherever they come, commerce is carried on with ſpirit and advantage.

(3.) ARMENIANS, RELIGION OF THE. The religion of the Armenians is the Chriſtian, ſaid to have been firſt planted among them by St Bartholomew. They are in general of the Eutychian ſect, that is, they own but one nature in Jeſus Chriſt; and when they ſpeak of the hypoſtatical union, that he is perfect God and perfect man without mixture. They have a high eſteem for a book they call the *Little Goſpel*, which treats of the infancy of Jeſus, and ſays that the Virgin Mary being pregnant, her ſiſter Salome accuſed her of having proſtituted herſelf, to which the Virgin anſwered, that ſhe needed only to lay her hand on her belly, and ſhe would know how ſhe came to be with child: this Salome accordingly did, and fire came out of her belly, which conſumed the half of her body, upon which ſhe acknowledged her fault, and drew it back; after which it was healed by putting it to the ſame place. The Armenian clergy conſiſt of patriarchs, archbiſhops, doctors, ſecular prieſts, and monks. The ſecular prieſts are not allowed to marry a ſecond time; and therefore they take care to chooſe young healthy wives: they maintain themſelves and families by ſome occupation, inſomuch that they have hardly time to perform their eccleſiaſtical functions; they lie in the church on the vigils of thoſe days they are obliged to officiate. The Armenian monks are of the order of St Baſil; and every Wedneſday and Friday they eat neither fiſh, eggs, oil, nor any thing made of milk, and during Lent they live upon nothing but roots; they are allowed wine only on the Sunday

in the Holy Week, and meat on the Eaſter Sunday. Beſides the great Lent, they have 4 others of 8 days each, which are inſtituted to prepare for 4 great feſtivals of the Nativity, the Aſcenſion, the Annunciation, and of St George; in which times they muſt not ſo much as ſpeak of eggs, fiſh, oil, or butter! The Armenians abſtain at all times from eating of blood and things ſtrangled. They have ſeven ſacraments; baptiſm, confirmation, penance, the euchariſt, extreme unction, orders and matrimony. In baptiſm, the child is plunged three times into the water, and the ſame form of words that is uſed with us is repeated every time; the prieſt then puts a ſmall cord made with ſilk and cotton on the neck of the infant, and anoints his forehead, chin, ſtomach, arm-pits, hands, and feet, making the ſign of the croſs on each part. When the child is baptized, he is carried home by the godfather with ſound of drums and trumpets. The women do not go to church till 40 days after their delivery: and they obſerve many Jewiſh cuſtoms. At the communion, to which infants of two or three months old are admitted, the prieſts give a piece of the conſecrated hoſt ſoaked in the conſecrated wine. The elements are covered with a great veil, and placed in a cup-board near the altar, on the ſide of the goſpels. When the prieſt takes the chalice and pattin, he is followed by his deacons and ſubdeacons, with flambeaux and plates of copper furniſhed with bells: in this manner, with a cenſer before him, he goes in proceſſion round the ſanctuary; he then ſets them on the altar, pronounces the words of conſecration, and turns himſelf to the people, who fall down, kiſs the earth, and beat their breaſts; then, after taking it himſelf, he diſtributes the hoſt ſoaked in wine to the people. They conſecrate holy water but once a-year; at which time every one fills a pot and carries it home, which brings in a conſiderable revenue to the church. The Armenians ſeem to place the chief part of their religion in faſtings and abſtinences; and among the clergy, the higher the degree the lower they muſt live; inſomuch that it is ſaid the archbiſhops live on nothing but pulſe. Temperance is doubtleſs a virtue, but it is aſtoniſhing to what an abſurd extreme it has been carried under the name of *religion*; and how much prieſts of all religions have perſuaded mankind that they would recommend themſelves to the favour of the Almighty by abſtaining from even a *moderate* uſe of his benefits! The worſt of it is, that theſe artificial duties and factitious virtues uniformly eradicate the eſſence of all religion—morality; by leading thoſe who perform them to place great merit, in things of no value.

* ARMENTAL. ARMENTINE. *adj.* [*armentalis*, or *armentinus*, Lat.] Belonging to a drove or herd of cattle. *Dict.*

ARMENTIERS, a ſmall but elegant town of France in the department of the North. It was taken by Lewis XIV. in 1667. It is ſeated on the river Lis, 8 miles NW. of Liſle. Lon. 3. 3. E. Lat 50. 40. N.

* ARMENTINE. See ARMENTAL.

* ARMENTOSE. *adj.* [*armentoſus*, Lat.] Abounding with cattle. *Dict.*

ARMENUS. See ARMENIA, § 1.

ARMENUS LAPIS, *Armenian ſtone*, in natural hiſtory, a mineral ſubſtance, improperly called a *ſtone*; being no other than an ocherous earth, and properly called *blue ochre*. It is a very valuable ſubſtance in painting, being a bright and lively blue. It was ſo highly eſteemed among the ancients, that counterfeits were commonly attempted. Theophraſtus has recorded it as a thing judged worthy a place in the Egyptian annals, which of their kings had the honour of inventing the factitious kind; and he tells us the genuine native ſubſtance was a thing of that value, that preſents were made of it to great perſons, and that the Phœnicians were accuſtomed to pay their tribute in it.—It is a very beautiful earth, of an even and regular texture; and of a fine blue, ſometimes deeper, ſometimes paler, and frequently mixed with green. It is ſoft, tender, and light; of an even, but ſomewhat duſty ſurface; it adheres firmly to the tongue, and is dry, but not harſh to the touch. It eaſily breaks between the fingers and does not ſtain the hands. It is of a brackiſh diſagreeable taſte, and does not ferment with acids. It is a very ſcarce foſſil; but is found very pure, though in ſmall quantities, in the mines at Goſſelaer in Saxony. It is frequently found ſpotted with green, and ſometimes with black; and very often is mixed among the green ochre, called *berggruen* by the Germans, which has hence been erroneouſly called by its name. See BICE.

ARMERIUS. See DIANTHUS.

ARMESTON, a village in Northamptonſhire, near Polbrook.

ARMETHORP, a village in Yorkſhire, near Doncaſter.

* ARMGAUNT. *adj.* [from *arm* and *gaunt*.] Slender as the arm.—

So he nodded,
And ſoberly did mount an *armgaunt* ſteed.
Shakeſpeare.

ARMGRETE. *adj.* as thick as one's arm.

* ARM-HOLE. *n. ſ.* [from *arm* and *hole*.] The cavity under the ſhoulder.—Tickling is moſt in the ſoles of the feet, and under the *armholes*, and on the ſides. The cauſe is the thinneſs of the ſkin in thoſe parts, joined with the rareneſs of being touched there. *Bacon's Natural Hiſtory.*

ARMIERS, a town of France, in the department of the North, ſeated on the Sambre, 20 m. S. of Mons, and 8 SW. of Meaubeuge. Lon. 3. 45. E. Lat. 50. 71. N.

ARMIFEROUS, [from *arma*, arms, and *fero*, to bear.] bearing arms.

ARMIGER, a title of dignity, belonging to ſuch gentlemen as bear arms: and theſe are either by courteſey, as ſons of noblemen, eldeſt ſons of knights, or by creation, ſuch as the king's ſervants, &c. See ESQUIRE.

* ARMIGEROUS. *adj.* [from *armiger*, Lat. an armour-bearer.] Bearing arms.

(1.) ARMILAUSA, in antiquity, a ſhort military coat, reaching down only to the knee; ſo called, as being divided both before and behind, and only cloſe about the ſhoulders, *in humos tantum clauſa*, quaſi *armiclauſa*. The word is ſometimes alſo written, *armelauſa*, *armelauſia*, *armiclauſia*, and *armilauſia*.

(2.) ARMILAUSA, in eccleſiaſtical writers, the

the ſcapular of monks and canons, ſo called on account of its hanging from the arms. It is vulgarly called *patience*.

ARMILLA MEMBRANOSA, a name given by ſome anatomiſts to the annular ligament.

(1.) * ARMILLARY. *adj.* [from *armilla*, Lat. a bracelet.] Reſembling a bracelet.—When the circles of the mundane ſphere are ſuppoſed to be deſcribed on the convex ſurface of a ſphere, which is hollow within, and, after this, you imagine all parts of the ſphere's ſurface to be cut away, except thoſe parts on which ſuch circles are deſcribed; then that ſphere is called an *armillary* ſphere, becauſe it appears in the form of ſeveral circular rings, or bracelets, put together in a due poſition. *Harris's Deſcription of the Globes.*

(2.) ARMILLARY SPHERE, an artificial ſphere, (See No. 1.) which revolves upon its axis within a ſilvered horizon, which is divided into degrees, and moveable every way upon a braſs ſupporter. The other parts are the equinoctial, zodiac, meridian, the two tropics, and the two polar circles. It is repreſented in Plate IX. where P and Q repreſent the poles of the world, AD the equator, E L the ecliptic and zodiac, P A G D the meridian, or the ſolſtitial colure, T the earth, F G the tropic of cancer, A T the tropic of capricorn, MN the arctic circle, O V the antarctic, N and O the poles of the ecliptic, and R S the horizon. The *armillary* ſphere conſtructed by Dr Long, in Pembroke-hall, Cambridge, is 18 feet in diameter; and more than 30 perſons may conveniently ſit in it. The lower part of the ſphere inviſible in England is cut off; the whole apparatus is ſo contrived, that it may be turned round with as little labour as it takes to wind up a jack. See GEOGRAPHY.

(3.) ARMILLARY TRIGONOMETER, an inſtrument firſt contrived by Mr Mungo Murray, and improved by Mr Ferguſon, conſiſting of five ſemicircles; viz. miridian, vertical circle, horizon, hour circle, and equator; ſo adapted to each other by joints and hinges, and ſo graduated and divided, as to ſerve for expeditiouſly reſolving many problems in aſtronomy, dialling, and ſpherical trigonometry. For the drawing, deſcription, and method of uſing it, ſee Ferguſon's Tracts, p. 80. &c.

* ARMILLATED. *adj.* [from *armillatus*, Lat.] Having bracelets. *Dict.*

ARMILLATI MILITES, thoſe who wore bracelets on their left arms beſtowed on them by their generals, or emperors. Though the term is more frequently applied to ſoft and effeminate ſoldiers, who wore bracelets on their arms, not as the rewards of their proweſs, but marks of their foppery.

ARMILUSTRIUM, in Roman antiquity, a feaſt held among the Romans, in which they ſacrificed, armed, to the ſound of trumpets.

ARMIN, two villages, in Yorkſhire, near Barkſton, on the river Air, diſtinguiſhed by the names of,

1. ARMIN MAGNA, and
2. ARMIN PARVA.

ARMINA. See ARMENE.

ARMINGALE, a village in Norfolk, near Cringleton, 5 miles S. of Norwich.

* ARMINGS. *n. ſ.* [in a ſhip.] The ſame with ſaſtecloaths being clothes hung about the ſides of the ſhip's upper works fore and aft, and before the cubbridge heads. Some are alſo hung round the tops, called *top-armings*. *Chambers.*

ARMINGTON, a village in Devonſhire, on the river Arm, near Plymington.

ARMINIANISM, the doctrine of Arminius and of his followers. See ARMINIANS, § 2.

ARMINIANS, a religious ſect, which aroſe in Holland, by a ſeparation from the Calviniſts. They followed the doctrine of ARMINIUS, (ſee that article,) who, thinking the doctrine of Calvin, in regard to free-will, predeſtination, and grace, too ſevere, began to expreſs his doubts concerning them in the year 1591; and upon farther inquiry adopted ſentiments more nearly reſembling those of the Lutherans than of the Calviniſts. After his appointment to the theological chair, at Leyden, he thought it his duty to avow and vindicate the principles which he had embraced; and the freedom with which he publiſhed and defended them expoſed him to the reſentment of thoſe who adhered to the theological ſyſtem of Geneva, which then prevailed in Holland; but his principal opponent was Gomar, his colleague. The controverſy which was thus begun, became more general after the death of Arminius, in the year 1609, and threatened to involve the United Provinces in civil diſcord. The Arminian tenets gained ground under the mild and favourable treatment of the Magiſtrates of Holland, and were adopted by ſeveral perſons of merit and diſtinction. The Calviniſts, or Gomariſts, as they are ſometimes called, appealed to a national ſynod: accordingly the ſynod of Dort was convened by order of the States General, in 1618, and was compoſed of the cleſiaſtical deputies from the United Provinces as well as from the reformed churches of England, Heſſia, Bremen, Switzerland, and the Palatinate. The principal advocate in favour of the Arminians was Epiſcopius, who at that time was profeſſor of divinity at Leyden. It was firſt propoſed to diſcuſs the principal ſubjects in diſpute, that the Arminians ſhould be allowed to ſtate and vindicate the grounds on which their opinions were founded: but ſome difference ariſing as to the preciſe mode of conducting the debate, the Arminians were excluded from the aſſembly; their cauſe was tried in their abſence; and they were pronounced guilty of peſtilential errors, and condemned as corrupters of the true religion. In conſequence of this deciſion, they were treated with great ſeverity; they were deprived of all their poſts and employments; their miniſters were ſilenced, and their congregations were ſuppreſſed. However, after the death of Prince Maurice, who had been a violent partizan in favour of the Gomariſts, in the year 1625, the Arminian exiles were reſtored to their former reputation and tranquillity; and under the toleration of the ſtate, they erected churches and founded a college at Amſterdam, appointing Epiſcopius the firſt theological profeſſor. The Arminian ſyſtem has very much prevailed in England ſince the time of Archbiſhop Laud, and its votaries in other countries are very numerous.

(2.) ARMINIANS, PECULIAR TENETS OF THE. The diſtinguiſhing tenets of the Arminians are

be comprised in the following five articles; relating to predestination, universal redemption, the corruption of man, conversion, and perseverance: viz. I. "That God, from all eternity, determined to bestow salvation on those who he foresaw would persevere unto the end in their faith in Christ Jesus; and to inflict everlasting punishments on those who should continue in their unbelief, and resist unto the end his divine succours: so that election was conditional, and reprobation in like manner the result of foreseen infidelity and persevering wickedness." II. "That Jesus Christ, by his sufferings and death, made an atonement for the sins of all mankind in general, and of every individual in particular; that, however, none but those who believe in him can be partakers of their divine benefit." III. "That true faith cannot proceed from the exercise of our natural faculties and powers, nor from the force and operation of free will; since man, in consequence of his natural corruption, is incapable either of thinking or doing any good thing; and that therefore it is necessary, in order to his conversion and salvation, that he be regenerated and renewed by the operation of the Holy Ghost, which is the gift of God through Jesus Christ." IV. "That this divine grace, or energy of the Holy Ghost, begins and perfects every thing that can be called good in man, and consequently all good works are to be attributed to God alone; that nevertheless, this grace is offered to all, and does not force men to act against their inclination, but may be resisted and rendered ineffectual by the perverse will of the impenitent sinner." Some modern Arminians interpret this and the last article with a greater latitude." V. "That God gives to the truly faithful, who are regenerated by his grace, the means of preserving themselves in this state;" and though the first Arminians made some doubt with respect to the closing part of this article, their followers uniformly maintain, "that the regenerate may lose true justifying faith, forfeit their state of grace, and die in their sins." The modern system of Arminianism likewise, founded on a liberal and comprehensive plan projected by Arminius himself, as appears from a passage in his last will, extends the limits of the Christian church, and relaxes the bonds of fraternal communion in such a manner, that Christians of all sects and denominations, whatever their sentiments and opinions may be, papists excepted, may be formed into one religious body, and live together in brotherly love and concord. But, to avoid the reproach of being altogether unconnected by any common principles, Episcopius drew up a confession of faith, expressed for the most part in words and phrases of Holy Scripture, which the Arminians have generally adopted, though not imposed upon them by any authoritative obligation. The Arminians are also called *Remonstrants*, from an humble petition entitled their *Remonstrance*, which, in the year 1610, they addressed to the States of Holland. Their principal writers are, Arminius, Episcopius, Vorstius, Grotius, Barcellæus, Limborch, Le Clerc, and Wetstein; not to mention many others of more modern date. It is generally supposed, that a majority of the clergy, in both the established churches of Great Britain, favour the Arminian system, in their sentiments and doctrines.

ARMINIUS, James, whose name in Low Dutch was James Hermanni, a famous Protestant divine, from whom the modern sect of Arminians (see the preceding article) take their name, was born at Oude-water, in Holland, 1560. He was ordained minister at Amsterdam on the 11th of August 1588; when he soon distinguished himself by his sermons, which were remarkable for their solidity and learning, and gained him universal applause. Martin Lydias, professor of divinity at Franker, judging him a fit person to refute a writing in which Beza's doctrine of predestination had been attacked by some ministers of Delft, desired Arminius to undertake the task; which he did, but upon thoroughly examining the reasons on both sides, he came into the opinions he proposed to destroy, and afterwards went still farther than the ministers of Delft had done. In 1600, he opposed those who maintained that ministers should subscribe the confession and catechism every year. In 1602, a pestilential disease raged at Amsterdam, during which he acted with the greatest resolution and courage, in assisting the poor, and comforting the sick; and Lucas Trelcatius and Francis Junius dying of that disease at Leyden, the curators of that university chose Arminius professor of divinity there, and afterwards made him D. D. Disputes upon grace were soon after kindled in that university; and he was at length engaged in a new contest, occasioned by a disputation of his concerning the divinity of the Son. These contests, his continual labour, and the concern of seeing his reputation blasted by a multitude of slanders in relation to his opinions, impaired his health and constitution, and threw him into a fit of sickness, of which he died on the 19th of October 1609. Arminius was esteemed an excellent preacher: his voice was low, but very agreeable; and his pronunciation admirable: he was easy and affable to persons of all ranks, and facetious in his conversation amongst his friends. His great desire was, that Christians would bear with one another in all controversies which did not affect the fundamentals of their religion; and when they persecuted each other for indifferent points, it gave him the utmost dissatisfaction. The curators of the university of Leyden had so great a regard for him, that they settled a pension upon his widow and children. He left several works, viz. 1 "Disputationes de diversis Christianæ religionis capitibus. 2. Orationes, itemque tractatus insigniores aliquot. 3. Examen modesti libelli Gulielmi Perkinsii de prædestinationis modo et ordine, itemque de amplitudine gratiæ divinæ. 4. Analysis capitis noni ad Romanos. 5. Dissertatio de vero et genuino sensu capitis septimi epistolæ ad Romanos. 6. Amica collatio cum D. Francisco Junio de prædestinatione per literas habita. 7. Epistola ad Hippolytum a collibus."

ARMIRO, a sea port town of Macedonia, in European Turky, seated on the Gulph de Velo, 30 miles NW. of Negropont, and 30 SE. of Larissa. It is reckoned the ERETRIA of the ancients. Lon. 23. 40. E. Lat. 39. 42. N.

* ARMIPOTENCE. *n. f.* [from *arma*, arms, and *potentia*, power, Lat.] Power in war.

* ARMIPOTENT. *adj.* [*armipotens*, Lat.] Powerful in arms; mighty in war.—

The manifold linguist, and the *armipotent* soldier. *Shak.*

* ARMISONOUS. *adj.* [*armisonus*, Lat.] Rustling with armour.

* ARMISTICE. *n. f.* [*armistitium*, Lat.] A short truce; a cessation of arms for a short time.

* ARMLET. *n. f.* [from *arm.*] 1. A little arm; as, an *armlet* of the sea. 2. A piece of armour for the arm. 3. A bracelet for the arm.—

Every nymph of the flood her tresses rending,
Throws off her *armlet* of pearl in the main.
Dryden.

ARMOISIN, a silk stuff, or kind of taffety, manufactured in the East Indies, at Lyons in France, and at Lucca in Italy. That of the Indies is slighter than those made in Europe.

* ARMONIACK. *n. f.* [erroneously so written for *ammoniac.*] A sort of volatile salt. See AMMONIAC.

ARMONICA. See HARMONICA.

ARMOR. [modern orthography.] See ARMOUR.

ARMORACIA, in botany, a name given by the ancients to a kind of raddish. Pliny mentions it, but his account is not satisfactory.

* ARMORER. *n. f.* [*armorier*, Fr.] 1. He that makes armour, or weapons.—The *armorers* make their steel more tough and pliant, by aspersion of water and juice of herbs. *Bacon.* 2. He that dresses another in armour.—The morning he was to join battle with Harold, his *armorer* put on his backpiece before, and his breastplate behind. *Cambden.*

(1.) * ARMORIAL. *adj.* [*armorial*, Fr.] Belonging to the arms or escutcheon of a family, as ensigns *armorial.*

(2.) ARMORIAL is also a title given to books, which contain the arms of persons of quality.

(1.) ARMORIC, or ARMORIC, something that belongs to the province of Bretagne, or Britany, in France. See ARMORICA.

(2.) ARMORIC LANGUAGE, the language used among the inhabitants of Britany. The French usually call this language *Bas-breton.* It is a dialect of the Welch, and a-kin to the Cornish language. The inhabitants of Britany, of Cornwall, and of Wales, formerly understood each other's speech; but considerable diversities have crept in since their separation from each other. The inhabitants of Britany, Mr Lluyd observes, by their intercourse with the French, have much altered their ancient orthography. There are several words in the Armoric which have no affinity with the Welch: and both the Armoric and Cornish retain several ancient words and phrases which are now lost in the Welch. Julian Manoir, a Jesuit, has published an Armoric grammar and vocabulary, in French, which has been translated into English by Mr Williams, and published with notes by Mr Lluyd. Yvon Quillivere published an Armoric vocabulary at Paris, in 1621. To and has given a catalogue of several Armoric words, which prove to be Irish; also a vocabulary Armoric and Irish.

ARMORICA, the ancient name of the whole northern and western coast of Gaul, from the Pyreneans to the Rhine; under which name it was known even in Cæsar's time. The word is *Bas-breton* origin, and denotes *maritime*; being compounded, according to M. Menage, of upon, and *mor*, sea.

(1.) * ARMORIST. *n. f.* [from *armour.*] A person skilled in heraldry. *Dict.*

(2.) ARMORIST, signifies also a person skilled in armory.

ARMORUM CONCUSSIO, the clashing of armour practised by the Roman armies previous to an engagement, and intended to strike a panic to their enemies: It always followed the Cuneus and the Barritus. See BARRITUS and CLASSICUM.

* ARMORY. *n. f.* [from *armour.*] 1. The place in which arms are repolited for use.—Let a man consider these virtues, with the contrary vices, and then, as out of a full *armory*, or magazine, let him furnish his conscience with [illegible] of Scripture. *South.* 2. Armour; arms of defence.—

Night at hand
Celestial *armory*, shields, helms, and spears
Hung high, with diamond flaming, and [illegible] gold.

3. Ensigns armorial.—

Well worthy be you of that *armory*,
Wherein you have great glory won this day.
Fairy Q.

(1.) * ARMOUR. *n. f.* [*armatura*, Fr. *armatura*, Lat. Defensive arms.—

Your friends are up, and buckle on their *armour.*

(2.) ARMOUR, DESCRIPTION OF. The word implies a defensive habit, to secure the body from the attacks of an enemy. In ancient statutes it is frequently called *harneis.* The parts of armour are, the buckler, cuirass, helmet, coat of mail, gauntlet, &c. A complete armour anciently consisted of a casque or helm, a gorget, cuirass, tassets, brassets, cuishes, and covers for the legs, to which the spurs were fastened. This was called *armour cap-a-pie*; and was the habit of the cavaliers and men at arms.—The infantry had only part of it; viz. a pot or head piece, a cuirass and tasses; but all light. Lastly, the horses themselves had armour, to cover the head and breast. Of all this furniture of war, scarce any thing now retained except the cuirass; the gorget or neck-piece, worn by officers, being at present only a badge of honour, and of no defence. The gallantry of going to battle without any defensive armour, prevailed so far among the French, that in the reign of Louis XIV. that continual ordinances were issued to restrain it; in consequence of which the general officers, and those of the cavalry, were obliged to resume the cuirass, which however has been but ill observed.

* ARMOUR BEARER. *n. f.* [from *armour* and *bear.*] He that carries the armour of another.

His *armour bearer* first, and next he bore
His charioteer.

ARMOUR, COAT, is the escutcheon of any person, or family, with its several charges, and its furniture; as mantling, creft, supporters, motto, &c.—Thus we say, a gentleman of ancient coat-armour, meaning one who bears arms.

(1.) ARMOURER. See ARMORER.

(2.) ARMOURER OF A SHIP, a perſon whoſe office is to take care that the arms be in a condition fit for ſervice.

(3.) ARMOURERS, in Roman antiquity, were diſpoſed in certain places in the empire, it being forbid either to ſell, or buy, or make arms elſewhere. They were exempted from all offices and taxes, and received a ſalary from the public. When once they had taken the employment, neither they, nor their children, were allowed to quit it. To prevent this, they had a kind of mark impreſſed on the arm, whereby they might be known. If any of them fled, or recreted their ware, the reſt were obliged to anſwer for him; on account of which the effects of ſuch as died without a legal heir went to the college.—There were 15 armamentaries, in the Eaſtern empire, placed near the frontiers. and 19 in the Weſtern.

(1.) ARMOURY. See ARMORY.

(2.) ARMOURY, in heraldry, the knowledge of coat-armours, as to their blazons, and various intendments.

ARMOY, a ſmall town of Ireland, in the county of Antrim, 109 miles from Dublin.

ARMOZA, or HARMOZIA, a town in Carmania, at the mouth of the Anamis, which falls into the Perſian gulf; called ARMUZA, by Ptolemy. From this the neighbouring iſland, and a ſmall kingdom, take the modern name of *Ormus*. Lon. 56. 17. E. Lat. 27. 20. N.

(1.) * ARMPIT. *n. ſ.* [from *arm* and *pit*.] The hollow place under the ſhoulder.—The handles to theſe gouges are made ſo long, that the handle may reach under the *armpit* of the workman. *Moxon.*

(2.) ARM-PIT. See AXILLA.

(I. 1.) * ARMS. *n. ſ without the ſingular number.* [*arma*, Lat.] 1. Weapons of offence, or armour of defence.—

Thoſe *arms* which Mars before
Had given the vanquiſh'd, now the victor bore.
Pope.

2. A ſtate of hoſtility.—

Sir Edward Courtney, and the haughty prelate,
With many more confed'rates, are in *arms*.
Shakeſpeare.

3. War in general.—

Him Paris follow'd to the dire alarms,
Both breathing ſlaughter, both reſolv'd in *arms*.
Pope.

4. Action; the act of taking arms.—

The ſeas and rocks and ſkies rebound,
To *arms*, to *arms*, to *arms*! *Pope.*

5. The enſigns armorial of a family.

(2.) ARMS alſo are uſed figuratively for the profeſſion of a ſoldier. Thus we ſay he was bred to arms.

(3.) ARMS, ANCIENT. Arms of ſtone, and even of braſs, appear to have been uſed before men made uſe of iron and ſteel. Joſephus aſſures us, that the patriarch Joſeph firſt taught the uſe of iron arms in Egypt, arming the troops of Pharaoh with a caſque and buckler. What contributed moſt to render the Romans maſters of the world, was, that having ſucceſſively warred againſt all nations, they conſtantly renounced their own methods, arms, &c. whenever they met with better. Thus Romulus, during his war with the Sabines, a bold and warlike nation, adopted their broad buckler in lieu of the ſmall Argian buckler, which he had uſed till that time. The principal arms of the ancient Britons were hatchets, ſcythes, lances, ſwords, and bucklers: the Saxons, &c. brought in the halbard, bow, arrows, arbalets, &c. By the ancient laws of England, every man was obliged to bear arms, except the judges and clergy. By act, 33. Hen VIII. it was expreſsly enjoined on all perſons to be regularly inſtructed, even from their tender years, in the exerciſe of the arms then in uſe; viz. the long bow and arrows; and to be provided with a certain number of them. The ancient arms of our Scots Highlanders are, the broad ſword, target, poinard and *whingar*, or durk.

(4.) ARMS, ETYMOLOGY AND ORIGIN OF. Nicot derives the word from the Latin phraſe *quod operiant armos*, becauſe they cover the ſhoulders or ſides; but Varro derives *arma*, *ab arcendo*, *eo quod arceant hoſtes*. It is ſuppoſed that the firſt artificial arms were of wood, and were only employed againſt beaſts; and that Belus, the ſon of Nimrod, was the firſt that wag'd war: whence according to ſome, came the appellation *bellum*. Diodorus Siculus takes Belus to be the ſame with Mars, who firſt trained ſoldiers up to battle.

(5.) ARMS, FIRE, are thoſe charged with powder and ball: ſuch are cannon, mortars, and other ordnance; muſkets, carabines, piſtols, and even bombs, granadoes, carcaſſes, &c. In the Hiſtory of the Royal Academy for 1707, we have an account of ſome experiments made with fire-arms differently loaded, by M. Caſſini. Among other things he obſerves, that by loading the piece with a ball which is ſomewhat leſs than the calibre, and only laying a little gunpowder below the ball and a good deal above it, it will yield a vehement noiſe, but have no ſenſible effect or impulſe on the ball.—This he takes to have been the whole ſecret of thoſe people who pretended to ſell the art of rendering one's ſelf invulnerable, or ſhot-proof.

(6.) ARMS OF PARADE, or COURTESY, were thoſe uſed in the ancient juſts and tournaments; which were commonly unſhod lances, ſwords without edge or point, wooden ſwords, and even canes.

(7.) ARMS, PASS OF, was a kind of combat in uſe among the ancient cavaliers.

(8.) ARMS, STAND OF, ſignifies a muſket, a bayonet, a ſword, belt, and cartridge-box.

(II.) ARMS, in falconry, denote the legs of a hawk, from the thigh to the foot. See FALCONRY.

(III.) ARMS, in heraldry, or ARMORIES, are uſed for marks of dignity and honour, regularly compoſed of certain figures and colours, given or authoriſed by ſovereigns, and borne in banners, ſhields, coats, &c. for the diſtinction of perſons, families, and ſtates; and paſſing by deſcent to poſterity.—They are called *arms*. in regard they are borne principally on the buckler, cuiraſs, banners, and other apparatus of war. They are alſo called *coats of arms coat armour*, &c. becauſe anciently embroidered on fur coats, &c. See HERALDRY.—Some will have the name to have been firſt occaſioned by the ancient knights, who in their juſts and tournaments, bore cer-

tain marks (which were frequently their miſtreſs's favours) in their armour, i. e. their helms or ſhield, to diſtinguiſh them from each other. Arms at preſent, follow the nature of titles, which being made hereditary, theſe are alſo become ſo, being the ſeveral marks for diſtinguiſhing of families and kindreds, as names are of perſons and individuals. They are diſtinguiſhed by various epithets, ſuch as,

1. ARMS, ASSUMPTIVE, are ſuch as a man has a right to aſſume of himſelf, in virtue of ſome gallant action. As, if a man who is no gentleman of blood, nor has coat armour, takes a gentleman, lord, or prince, priſoner, in any lawful war; he becomes entitled to bear the ſhield of ſuch priſoner, and enjoy it to him and his heirs. The foundation hereof is that principle in military law, that the dominion of things taken in lawful war paſſes to the conqueror.

2. ARMS, CANTING, are thoſe wherein the figures bear an alluſion to the name of the family. Such are thoſe of the family of Prado in Spain, whoſe field is a meadow. Moſt authors hold theſe the moſt noble and regular, as is ſhown by an infinity of inſtances produced by father Varenne and Menetrier.—They are much debaſed, when they come to partake of the *Rebus*.

3. ARMS, CHARGED, are ſuch as retain their ancient integrity and value, with the addition of ſome new honourable charge or bearing, in conſideration of ſome noble action.

4. ARMS, FALSE, or IRREGULAR, are thoſe wherein there is ſomething contrary to the eſtabliſhed rules of heraldry. As, when metal is put on metal, or colour on colour, &c. The laws of arms, with the cognizance of offences committed therein, belong, in Britain, to the earl marſhal and college of arms.

5. ARMS, FULL, or ENTIRE, are ſuch as retain their primitive purity, integrity, or value; without any alterations, abatements, or the like.—It is a rule, that the ſimpler and leſs diverſified the arms, the more noble and ancient they are. For this reaſon Garcias Ximenes, firſt king of Navarre, and his ſucceſſors for ſeveral ages, bore only gules, without any figure at all. The arms of princes of the blood of all younger ſons, and junior families, are not pure and full; but diſtinguiſhed and diminiſhed by proper differences, &c.

6. ARMS OF ALLIANCE, are thoſe which families or private perſons join to their own, to denote the alliances which they have contracted by marriage.

7. ARMS OF COMMUNITY, are thoſe of biſhopries, cities, univerſities, and other bodies corporate.

8. ARMS OF CONCESSION, or augmentation of honour, are either entire arms, or elſe one or more figures given by princes, as a reward for ſome extraordinary ſervice.

9. ARMS OF DOMINION, are thoſe which emperors, kings, and ſovereign ſtates bear; being annexed to the territories which they poſſeſs. Thus the three lions are the arms of England; the fleurs de lys thoſe of France, &c.

10. ARMS OF FAMILY, or PATERNAL ARMS, are ſuch as belong to a particular family, and which no other perſon has a right to aſſume.

11. ARMS OF PATRONAGE, are thoſe which governors of provinces, lords of manors, &c. add to their family arms, in token of their peculiar ſuperiority and juriſdiction.

12. ARMS OF PRETENSION, are thoſe of ſuch kingdoms or territories to which a prince or lord has ſome claim, and which he adds to his own, though the kingdoms or territories be poſſeſſed by a foreign prince or other lord. Thus the kings of England have quartered the arms of France with their own, ever ſince the claim of Edward III. to that kingdom, in 1330.

13. ARMS OF SUCCESSION, are aſſumed by thoſe who inherit eſtates, manors, &c. by will, entail, or donation, and which they either impale or quarter with their own arms.

14. ARMS, PARTED, COUPED, QUARTERED, &c. See PARTI, &c.

15. ARMS, POURSUIVANT, KING AT, &c. See POURSUIVANT, KING, &c.

(IV.) ARMS, in law, are extended to any thing which a man takes in his hand in his wrath, to caſt at, or ſtrike another. By the common law, it is an offence for perſons to go or ride armed with dangerous weapons; but gentlemen may wear common armour, according to their quality, &c. 3d Inſt. The king may prohibit force of arms, and puniſh offenders according to law; and here in every ſubject is bound to be aiding Stat. 7. Edw. I. None ſhall come with force and arms before the king's juſtices, nor ride armed in affray of the peace, on pain to forfeit their armour, and to ſuffer impriſonment, &c. 2 Ed. III. c. 3. The importation of arms and ammunition are prohibited by 1 Jac. II. c. 8. and by 1 W. and M. ſtat. 2. c. 2. Proteſtant ſubjects may have arms for their defence. So likewiſe arms, &c. ſhipped after prohibition, are forfeited, by 29 Geo. I. c. 16. ſec. 1. Arms of offence in uſe among us at preſent are, the ſword, piſtol, muſket, bayonet, pike, &c. There are ſeveral acts of parliament for diſarming the Highlanders; ſee 1 Geo. I. c. 54. 11 Geo. I. c. 26. 19 Geo. II. c. 39. 21 Geo. II. c. 34. 26 Geo. II. c. 22. and 29.

(V.) ARMS, in natural hiſtory, denote the natural weapons, or parts of defence, of beaſts: as claws, teeth, tuſks of elephants, beaks of birds, &c.

* ARM'S END. *n. ſ.* A phraſe taken from boxing, in which the weaker man may overcome the ſtronger, if he can keep him from cloſing.—Such a one as can keep him at *arm's end*, need never wiſh for a better companion. *Sidney's Arcadia.*—For my ſake be comfortable, hold death awhile at the *arm's end*. *Shakeſpeare.*—In the ſame ſenſe is uſed *arm's length*.

ARMSIDE, a village in Weſtmoreland, near Little Langdale, on the borders of Cumberland.

(1) ARMSTRONG, John, M. D. an eminent phyſician, poet, and miſcellaneous writer, was born in Caſtleton pariſh, Roxburghſhire, where his father and brother were miniſters; completed his education in the univerſity of Edinburgh; where he took his degree in Phyſic, Feb. 4. 1732, with much reputation; and publiſhed his theſis, as the forms of that univerſity require, *De tabe puruleuta*. In 1735 he publiſhed a little humorous fugitive pamphlet in 8vo, entitled, "An Eſſay for abridging the Study of Phyſic; to which is added a Dialogue

Dialogue betwixt Hygeia, Mercury, and Pluto, relating to the Practice of Phyſic, as it is managed by a certain illuſtrious Society. As alſo an Epiſtle from Uſbek the Perſian, to Joſhua Ward. Eſq." This piece contains much drollery; in the dialogue, he has caught the very ſpirit of Lucian. In 1735 he publiſhed a Synopſis of the Hiſtory and Cure of the Veneral Diſeaſes, 8vo. This was ſoon followed by the *Oeconomy of Love*; a poem which has much merit, but it is too ſtrongly tinctured with the licentiouſneſs of Ovid. It is ſaid, that his maturer judgment expunged many of the luxuriances of youthful fancy, in an edition "reviſed and corrected by the author" in 1768. It appears by one of the caſes on literary property, that Mr Millar paid 50 guineas for the copy-right of this poem, which was intended as a burleſque on ſome dictatic writers. It has been obſerved of Dr Armſtrong, that his works have great inequalities, ſome of them being poſſeſſed of every requiſite of the moſt perfect compoſition, while others can hardly be conſidered as ſuperior to the productions of mediocrity. The *Art of Preſerving Health*, his beſt performance, was publiſhed in 1744, and will tranſmit his name to poſterity as one of the firſt of Britiſh writers; and as a man *acquainted with man*. In 1746, Dr Armſtrong was appointed one of the phyſicians to the hoſpital for lame and ſick ſoldiers behind Buckingham houſe. In 1751, he publiſhed his poem on Benevolence, in folio; and in 1753, "Taſte, an epiſtle to a young Critic. In 1758 appeared, "Sketches, or Eſſays on various ſubjects, by Launcelot Temple, Eſq. in two parts." In this production, which poſſeſſes much humour and knowledge of the world, and which had a remarkably rapid ſale, he is ſuppoſed to have been aſſiſted by Mr Wilkes. In 1760 he was appointed phyſician to the army in Germany, where, in 1761, he wrote a poem, called "Day, an Epiſtle to John Wilkes of Ayleſbury, Eſq." In this poem, which is not collected with his works, he wantonly hazarded a reflection on Churchill, which drew upon him the ſerpent-toothed vengeance of that ſevereſt of ſatiriſts, whoſe embalming or corroſive pen could deify or lampoon any man, according as he acquieſced with, or diſſented from, his political principles. In 1770, Dr Armſtrong publiſhed a collection of "Miſcellanies in 2 vols.; containing, 1. The Art of preſerving Health. 2. Of Benevolence, an Epiſtle to Eumenes. 3. Taſte, an Epiſtle to a young Critic, 1753. 4. Imitations of Shakeſpeare and Spenſer. 5. The Univerſal Almanac, by Noureddin Ali. 6. The Forced Marriage, a tragedy. 7. Sketches" In 1771, he publiſhed "A ſhort ramble through ſome parts of France and Italy, by Launcelot Temple; and in 1773, in his own name, a 4to pamphlet, entitled, *Medical Eſſays*; towards the concluſion of which, he accounts for his not having ſuch extenſive practice as ſome of his brethren, from his not being qualified to employ the uſual means, from a ticklish ſtate of ſpirits, and a diſtempered exceſs of ſenſibility. He complains much of the behaviour of ſome of his brethren, of the herd of critics, and particularly of the reviewers. He died in Sept. 1779; and to the ſurpriſe of his friends, left more than L. 300 ſaved out of a very moderate income, ariſing principally from his half-pay.

(2.) ARMSTRONG, Sir Thomas, an Engliſh gentleman, whoſe activity in behalf of the king during the rebellion, cauſed Cromwell impriſon him and threaten his life. He was an open enemy to popery, and entered very warmly into the duke of Monmouth's ſervice. An inſurrection having been planned by the country party, ſoon after the new ſheriffs were impoſed on the city of London by the influence of the court, Sir Thomas Armſtrong went with the duke of Monmouth to inſpect the king's guards, for the purpoſe of judging whether they might hazard an attack upon them in the intended inſurrection; after which, finding himſelf obnoxious to the court, he haſtily left the kingdom, and was outlawed. He was ſeized abroad, ſent to London, and condemned and executed without a trial, in 1684.

(3.) ARMSTRONG, John, a Scottiſh writer, was born at Leith and educated at Edinburgh, where he took the degree of M.A. While he was in the univerſity, he publiſhed a volume of Juvenile Poems, with an Eſſay on the means of puniſhing and preventing Crimes. In 1790 he went to London, where, though he preached occaſionally in ſome of the diſſenting meeting houſes, his chief ſupport was from his writing for the daily papers. In the midſt of increaſing reputation and proſpects, he was carried off, at the age of 26, 1797.

ARMUYDEN, a ſea port town of Zealand, in the iſland of Valcherin, formerly very flouriſhing; but now inconſiderable, the ſea having ſtopped up the harbour with ſand. The ſalt works are its chief reſource. It lies 3 miles E. of Middleburg, at the mouth of the canal. Lon. 3. 42. E. Lat. 51. 31. N.

ARMUZA. See ARMORA.

(1.) * ARMY. *n. ſ.* [*armée*, Fr.] 1. A collection of armed men, obliged to obey one man. *Locke.*—Number itſelf importeth not much in *armies*, where the people are of weak courage. *Bacon.* 2. A great number.—The fool hath planted in his memory an *army* of good words. *Shakeſp.*

(2.) ARMY is rather more accurately defined, a large number of ſoldiers, conſiſting of horſe and foot, completely armed, and provided with artillery, ammunition, proviſions, &c. under the command of one general, having lieutenant generals, major generals, brigadiers, and other officers under him. An army is compoſed of ſquadrons and battalions; and is uſually divided into three corps, and formed into three lines: the firſt line is called the *van-guard*, the ſecond the *main-body*, and the third the *rear-guard*, or *body of reſerve*. The middle of each line is poſſeſſed by the foot; the cavalry form the right and left wing of each line; and ſometimes they place ſquadrons of horſe in the intervals between the battalions. When the army is drawn up in order of battle, the horſe are placed 5 feet diſtant from each other, and the foot 4. In each line the battalions are diſtant from each other 180 feet, which is nearly equal to the extent of their front; and the ſame holds of their ſquadrons, which are about 300 feet diſtant, the extent of their own front. Theſe intervals are left for the ſquadrons and battalions of

the

the ſecond line to range themſelves againſt the intervals of the firſt, that both may more readily march through theſe ſpaces to the enemy: the firſt line is uſually 300 feet diſtant from the ſecond, and the ſecond from the third, that there may be ſufficient room to rally when the ſquadrons and battalions are broken. See the article WAR.

(2.) ARMY, NAVAL, or SEA ARMY, is a number of ſhips of war, equipped and manned with ſailors and mariners, under the command of an admiral, with other inferior officers under him. See NAVAL TACTICS.

(4.) ARMY OF OBSERVATION, is employed by beſiegers, to prevent relief being brought into a place, or the ſiege being raiſed by the enemy.

(5.) ARMY, ROYAL, is an army marching with heavy cannon; capable of beſieging a ſtrong, well fortified city.

(6.) ARMY, STANDING, an army kept conſtantly in pay, and ready for action, in peace as well as in war. It has been obſerved, that in Europe a prince with a million of ſubjects cannot keep an army of above 10,000 men, without ruining himſelf. It was otherwiſe in the ancient republics: the proportion of ſoldiers to the reſt of the people, which is now as about 1 to 100, might then be as 1 to 8. The reaſon ſeems owing to that equal partition of lands which the ancient founders of commonwealths made among their ſubjects; ſo that every man had a conſiderable property to defend, and means to defend it with: whereas, among us, the lands and riches of a nation being ſhared among a few, the reſt have no way of ſubſiſting but by trades, arts, and the like; and have neither any free property to defend, nor means to enable them to go to war in defence of it, without ſtarving their families. A large part of our people are either artiſans or ſervants, and thus only miniſter to the luxury and effeminacy of the great. While the equality of lands ſubſiſted, Rome, though only a little ſtate, being refuſed the ſuccours which the Latins were obliged to furniſh, after the taking of the city in the conſulate of Camillus, preſently raiſed ten legions within its own walls; which was more, Livy aſſures us, than they were able to do in his time, when they were maſters of the greateſt part of the world. A full proof, adds the hiſtorian, that we are not grown ſtronger; and that what ſwells our city is only luxury, and the means and effects of it. Our armies anciently were a ſort of militia, compoſed chiefly of the vaſſals and tenants of the lords.—When each company had ſerved the number of days or months enjoined by their tenure, or the cuſtoms of the fees they held, they returned home. The armies of the empire conſiſt of divers bodies of troops furniſhed by the ſeveral circles. The greater part of the French armies, under the Merovingian race conſiſted of infantry. Under Pepin and Charlemagne, the armies conſiſted almoſt equally of cavalry and foot: but after the decline of the Carlovingian line, the fees being become hereditary, the national armies, ſays Le Gendre, were chiefly cavalry. Of their armies under their preſent republican government, we need ſay nothing. All Europe is witneſs to their aſtoniſhing exertions, and ſome of the powers feel the effects of them. It is foreign to the preſent ſubject to inveſtigate the cauſe. But a well regulated ſtanding army is greatly ſuperior to a militia; although a militia, after ſerving two or three campaigns, may become equal to a ſtanding army, and in every reſpect a match for veteran troops. See MILITIA.

(7.) ARMY, STANDING, OF ANCIENT MACEDON. One of the firſt ſtanding armies of which we have any diſtinct account, in well authenticated hiſtory, is that of Philip of Macedon. His frequent wars with the Thracians, Illyrians, Theſſalyans, and ſome of the Greek cities in the neighbourhood of Macedon, gradually formed his troops, which in the beginning were probably militia, to the exact diſcipline of a ſtanding army. When he was at peace, which was very ſeldom, and never for any long time together, he was careful not to diſband that army. It vanquiſhed and ſubdued, after a long and violent ſtruggle, indeed the gallant and well exerciſed militias of the principal republics of ancient Greece: and afterwards, with very little ſtruggle, the effeminate and ill exerciſed militia of the great Perſian empire. The fall of the Greek republics and of the Perſian empire, was the effect of the irreſiſtible ſuperiority which a ſtanding army has over every ſort of militia. It is the firſt great revolution in the affairs of mankind of which hiſtory has preſerved any diſtinct or circumſtantial account. The fall of Carthage, and the conſequent elevation of Rome is the ſecond. All the varieties in the fortune of thoſe two famous republics may very well be accounted for from the ſame cauſe.

(8) ARMY, STANDING, OF CARTHAGE. From the end of the firſt to the beginning of the ſecond Carthaginian war, the armies of Carthage were continually in the field, and employed under three great generals, who ſucceeded one another in command; Hamilcar, his ſon-in-law Aſdrubal, and his ſon Hannibal; firſt in chaſtiſing their own rebellious ſlaves, afterwards in ſubduing the revolted nations of Africa, and, laſtly, in conquering the great kingdom of Spain. The army which Hannibal led from Spain into Italy muſt neceſſarily, in thoſe different wars, have been gradually formed to the exact diſcipline of a ſtanding army. The Romans, in the mean time, though they had not been altogether at peace, yet they had not, during this period been engaged in any war of very great conſequence; and their military diſcipline, it is generally ſaid, was a good deal relaxed. The Roman armies which Hannibal encountered at Trebia, Thraſymenus, and Cannæ, were militia oppoſed to a ſtanding army. The circumſtance, it is probable, contributed more than any other to determine the fate of thoſe battles. The ſtanding army which Hannibal left behind him in Spain, had the like ſuperiority over the militia which the Romans ſent to oppoſe it, and in a few years, under the command of the younger Aſdrubal, expelled them almoſt entirely from that country. Hannibal was ill ſupplied from home. The Roman militia, being continually in the field, became in the progreſs of the war a well diſciplined and well exerciſed ſtanding army; and the ſuperiority of Hannibal grew every day leſs and leſs. Aſdrubal judged it neceſſary to lead the whole or almoſt the whole, of the ſtanding army which he commanded in Spain, to the aſſiſtance of

of his brother in Italy. In this march he is ſaid to have been miſled by his guides: and in a county which he did not know, was ſurpriſed and attacked by another ſtanding army, in every reſpect equal or ſuperior to his own, and was entirly defeated. When Aſdrubal had left Spain, the great Scipio found nothing to oppoſe him but a militia inferior to his own. He conquered and ſubdued that militia; and in the courſe of the war, his own militia neceſſarily became a well-diſciplined and well exerciſed ſtanding army. That ſtanding army was afterwards carried into Africa, where it found nothing but a militia to oppoſe it. In order to defend Carthage it became neceſſary to recal the ſtanding army of Hannibal. The diſheartened and frequently defeated African militia joined it, and at the battle of Zama compoſed the greater part of the troops of Hannibal. The event of that day determined the fate of the two rival republics.

(9.) ARMY, STANDING, OF ROME, &c. From the end of the ſecond Carthaginian war till the fall of the Roman republic, the armies of Rome were in every reſpect ſtanding armies. The ſtanding army of Macedon, although far inferior, made ſome reſiſtance to their arms. In the height of their grandeur, it coſt them two great wars, and three great battles, to ſubdue that little kingdom: of which the conqueſt would probably have been ſtill more difficult, had it not been for the cowardice of its laſt king. The militias of all the civilized nations of the ancient world of Greece, of Syria, and of Egypt, made but a feeble reſiſtance to the ſtanding armies of Rome. The militias of ſome of the barbarous nations defended themſelves much better. The Scythian or Tartar militia, which Mithridates drew from the countries north of the Euxine and Caſpian ſeas, were the moſt formidable enemies whom the Romans had to encounter after the ſecond Carthaginian war.—The Parthian and German militias too were always reſpectable, and upon ſeveral occaſions gained very conſiderable advantages over the Roman armies. In general, however, and when the Roman armies were well commanded, they appear to have been very much ſuperior. Many different cauſes contributed to relax the diſcipline of the Roman armies. Its extreme ſeverity was, perhaps, one of thoſe cauſes. In the days of their grandeur, when no enemy appeared capable of oppoſing them, their heavy armour was laid aſide as burdenſome, their excerciſes were neglected as unneceſſarily toilſome. Under the Roman emperors too, the ſtanding armies of Rome, thoſe particularly which gaurded the German and Pannonian frontiers, became dangerous to their maſters, againſt whom they uſed frequently to ſet up their own generals. In order to render them leſs formidable, according to ſome authors, Dioclefian, according to others Conſtantine, firſt withdrew them from the frontier, where they had always before been encamped in great bodies, generally of two or three legions each, and diſperſed them in ſmall bodies through the different provincial towns, from whence they were ſcarce ever removed, but when it became neceſſary to repel an invaſion. Small bodies of ſoldiers quartered in trading and manufacturing towns, and ſeldom removed from thoſe quarters, became themſelves tradſemen, artificers, and manufacturers. The civil came to predominate over the military character; and the ſtanding armies of Rome gradually degenerated into a corrupt, neglected, and undiſciplined militia, incapable of reſiſting the attack of the German and Scythian militias, which ſoon afterwards invaded the weſtern empire. It was only by hiring the militia of ſome of thoſe nations to oppoſe to that of others, that the emperors were for ſome time able to defend themſelves. The fall of the weſtern empire is the third great revolution in the affairs of mankind, of which ancient hiſtory has preſerved any diſtinct or circumſtantial account. It was brought about by the irreſiſtible ſuperiority which the militia of a barbarous has over that of a civilized nation; which the militia of a nation of ſhepherds has over that of a nation of huſbandmen, artificers, and manufactures. The victories which have been gained by militias have generally been not over ſtanding armies, but over other militias in exerciſe and diſcipline inferior to themſelves. Such were the victories which the Greek militia gained over that of the Perſian empire; and ſuch too were thoſe which in later times the Swiſs militia gained over that of the Auſtrians and Burgundians. The military force of the German and Scythian nations, who eſtabliſhed themſelves upon the ruins of the weſtern empire, continued for ſome time to be of the ſame kind in their new ſettlements, as it had been in their original country.—It was a militia of ſhepherds and huſbandmen, which in time of war took the field under the command of the ſame chieftains whom it was accuſtomed to obey in peace. It was therefore tolerably well exerciſed, and tolerably well diſciplined. As arts and induſtry advanced, however, the authority of the chieftains gradually decayed, and the great body of the people had leſs time to ſpare for military exerciſes. Both the diſcipline and the exerciſe of the feudal militia, therefore went to ruin, and ſtanding armies were gradually introduced to ſupply the place of it. When the expedient of a ſtanding army, had once been adopted by one civilized nation, it became neceſſary that all its neighbours ſhould follow the example. They ſoon found that their ſafety depended upon their doing ſo, and that their own militia was altogether incapable of reſiſting the attack of ſuch an army.

(10.) ARMY, STANDING, SUPERIOR TO A MILITIA. The ſoldiers of a ſtanding army, though they may never have ſeen an enemy, yet have frequently appeared to poſſeſs all the courage of veteran troops, and the very moment that they took the field, to have been fit to face the hardieſt and moſt experienced veterans. In a long peace, the generals perhaps may ſometimes forget their ſkill; but where a well regulated ſtanding army has been kept up, the ſoldiers ſeem never to forget their valour. When a civilized nation depends for its defence upon a militia, it is at all times expoſed to be conquered by any barbarous nation which happens to be in its neighbourhood. The frequent conqueſts of all the civilized countries in Aſia, by the Tartars, ſufficiently demonſtrates the natural ſuperiority which the militia of a barbarous has over that of a civilized nation. A well

well regulated ſtanding army is ſuperior to every militia. Such an army as it, can beſt be maintained by an opulent and civilized nation, ſo it can alone defend ſuch a nation againſt the invaſion of a poor and barbarous neighbour. It is only by means of a ſtanding army, therefore, that the civilization of any country can be perpetuated, or even preſerved for any conſiderable time. As it is only by means of a well regulated ſtanding army, that a civilized country can be defended, ſo it is only by means of it, that a barbarous country can be ſuddenly and tolerably civilized. A ſtanding army eſtabliſhes, with an irreſiſtible force, the law of the ſovereign through the remoteſt provinces of the empire, and maintains ſome degree of regular government in countries which could not otherwiſe admit of any. Whoever examines with attention, the improvements which Peter the Great introduced into the Ruſſian empire, will find, that they almoſt all reſolve themſelves into the eſtabliſhment of a well regulated ſtanding army. It is the inſtrument which executes and maintains all his other regulations.—That degree of order and internal peace, which that empire has ever ſince enjoyed, is altogether owing to the influence of that army.

(11.) ARMY, STANDING UNFAVOURABLE TO LIBERTY, BUT SOMETIMES FRIENDLY TO IT.—Men of republican principles are jealous of a ſtanding army as dangerous to liberty. It certainly is ſo, wherever the intereſt of the general officers are not neceſſarily connected with the ſupport of the conſtitution of the ſtate. The ſtanding army of Cæſar deſtroyed the Roman republic; the ſtanding army of Cromwell turned the long parliament out of doors. But where the ſovereign is himſelf the general, and the principal nobility and gentry of the country the chief officers of the army; where the military force is placed under the command of thoſe who have the greateſt intereſt in the ſupport of the civil authority, becauſe they have themſelves the greateſt ſhare of that authority; a ſtanding army can never be dangerous to liberty; on the contrary, it may in ſome caſes be favourable to liberty. The ſecurity which it gives to the ſovereign renders unneceſſary that troubleſome jealouſy, which in ſome modern republics ſeems to watch over the minuteſt actions, and to be at all times ready to diſturb the peace of every citizen. Where the ſecurity of the magiſtrate, though ſupported by the principal people of the country, is endangered by every popular diſcontent; where a ſmall tumult is capable of bringing about, in a few hours, a great revolution; the whole authority of government muſt be employed to ſuppreſs and puniſh every complaint againſt it. To a ſovereign, on the contrary, who feels himſelf ſupported, not only by the natural ariſtocracy of the country, but by a well regulated ſtanding army, the rudeſt the moſt groundleſs, and the moſt licentious remonſtrances, can give little diſturbance. He can ſafely pardon or neglect them, and his conſciouſneſs of his own ſuperiority naturally diſpoſes him to do ſo. That degree of liberty which approaches to licentiouſneſs can be tolerated only in countries where the ſovereign is ſecured by a well regulated ſtanding army. It is in ſuch countries only, that the public ſafety does not require, that the ſovereign ſhould be truſted with any diſcretionary power, for ſuppreſſing even the impertinent wantonneſs of this licentious liberty. Perhaps no country ever needed a ſtanding army more than Great Britain has of late years,—ſurrounded and threatened by foreign enemies, while many of her own children ſeemed to vie with each other in contemning and degrading the powers which protected their liberty, and prevented them from that anarchy and confuſion which prevailed in France.

ARM, YARD. See YARD ARM.

ARMY LANDS, in geography, ſundry diſtricts in the United States of America, lying on the N. of the Ohio, and to the weſtward of Pennſylvania, ſituated between 80° and 91° Lon. W. and 37° and 41° Lat. N.

ARMYNE, Mary, an illuſtrious Engliſh lady, the daughter of Henry Talbot, 4th ſon of George earl of Shrewſbury, and wife of Sir William Armyne. She was a woman of great talents, and examplary piety. She had a good underſtanding of the French and Latin languages, and was well verſed in hiſtory and divinity. She made a practiſe of diſtributing books among the poor; and ſhe gave conſiderable ſums to the miſſionaries employed in converting the Indians in North America. Beſides many other deeds of public beneficence, ſhe endowed three hoſpitals. She died in 1675.

ARNA, or ARNI, a ſea port of Andros. See ANDROS, N° I. § 3.

ARNABOS, in the materia medica, an aromatic drug, deſcribed by Paulus Æginetа, and other Greek phyſicians, and ſuppoſed to be the ſame with the ZARNAB of Avicenna, the CARPESIA of the more ancient Greek writers. This was a drug much uſed as an aromatic and cordial, and allowed in many caſes to be a good ſubſtitute for cinnamon. It was the young ſhoots of the cubeb tree.

ARNALDIA, or ARNOLDIA, in phyſic, a new malignant kind of diſeaſe, frequent formerly in England; the moſt diſtinguiſhing ſymptom whereof was a falling off of the hair. Authors are much at a loſs for the nature of this diſeaſe, which appears to have been peculiar to our country. From the deſcription given of it in an ancient chronicle, Mollerus concludes it to have been a ſpecies of the venereal diſeaſe, as that diſtemper appeared in thoſe days in this country.

ARNALD, Richard, an Engliſh divine, was born in London, and educated at Benet College, Cambridge. He became fellow of Emanuel College; and in 1728 he took the degree of B. D. when he was preſented to the rectory of Thurcaſton, in Leiceſterſhire. He is chiefly celebrated for his Commentary on the Apocrypha; beſides which he publiſhed ſeveral ſermons. He died in 1756.

ARNALL, William, a noted political writer in defence of Sir Robert Walpole, was originally an attorney's clerk; but being recommended to Walpole, he employed him for a courſe of years in writing the *Free Briton*, and other papers, in defence of his adminiſtration. By the report of the ſecret committee, he appears to have received in the ſpace of *four* years, no leſs a ſum than L. 10,997:6:8 out of the treaſury for his ſer-

tings! but ſpending his money as faſt as it came, and his ſupplies ſtopping on Sir Robert's reſignation, he died broken hearted and in debt, in the 26th year of his age. His invention was ſo quick, that his employer uſed to ſay, no man in England could write a pamphlet in ſo little time as Arnall.

(1.) ARNAUD, D'ANDILLY, Anthony, the ſon of a celebrated advocate of the parliament of Paris, and a doctor of the Sorbonne, was born in 1612. He publiſhed, in 1643, *A Treatiſe on frequent Communion*, which highly diſpleaſed the Jeſuits; and the diſputes upon grace, which broke out about this time in the univerſity of Paris, and in which he took a zealous part with the Janſeniſts, helped to increaſe the animoſity. But nothing raiſed ſo great a clamour againſt him, as the two letters he wrote on *Abſolution*; in the ſecond of which the faculty of divinity found two propoſitions which they condemned, and M. Arnaud was expelled the ſociety. Upon this he retired; and during a retreat which laſted near 25 years, he compoſed that great variety of works which are extant, on grammar, geometry, logic, metaphyſics, and theology. In 1679, he withdrew from France, lived in obſcurity in the Netherlands, and died in 1694. His heart, at his own requeſt, was ſent to be depoſited in the Port Royal. Arnaud had a remarkable ſtrength of genius, memory, and command of his pen; nor did theſe decay, even to the laſt year of his life. Mr Bayle ſays, that he was a man very ſimple in his manners; and, that unleſs any one propoſed ſome queſtion to him, or deſired ſome information, he ſaid nothing that might make one take him for a man of great abilities; but, when he ſet himſelf to give an anſwer to ſuch as propoſed a point of learning, he ſeemed as it were transformed into another man: he would then deliver a multitude of fine things with great perſpicuity, and had a particular talent at making himſelf intelligible to perſons of not the greateſt penetration.

(2.) ARNAUD, D'ANDILLY, Robert, elder brother of Anthony, (N° 1.) was born in 1588; and, being introduced young at court, was employed in many conſiderable offices, all which he diſcharged with great integrity and reputation. In 1644 he quitted buſineſs, and retired into the convent of Port Royal des Champs, where he paſſed the remainder of his days in a continued application to works of piety and devotion; and enriched the French language with many excellent tranſlations of different writers, as well as with religious compoſitions of his own. He died in 1674, and his works are printed in 8 vols. folio.

(3.) ARNAUD, DE MEYRVEIH, or MEREUIL, a poet of Provence, who lived at the beginning of the 13th century. He wrote a book entitled *Las receſtenas de ſa comteſſe*, and a collection of poems and ſonnets. He died in 1220. Petrarch mentions him in his Triumph of Love.

(4.) ARNAUD, DE VILLA NOVA, a famous phyſician, who lived about the end of the 13th, and beginning of the 14th century. He ſtudied at Paris and Montpelier, and travelled through Italy and Spain. He was well acquainted with languages, and particularly with the Greek, Hebrew, and Arabic. He was at great pains to gratify his ardent deſire after knowledge; but this paſſion carried him too far in his reſearches: he endeavoured to diſcover future events by aſtrology, imagining this ſcience to be infallible; and upon this foundation he publiſhed a prediction, that the world would come to an end in the middle of the 14th century! He practiſed phyſic at Paris for ſome time; but having advanced ſome new doctrines, he drew upon himſelf the reſentment of the univerſity; and his friends fearing he might be arreſted, perſuaded him to retire from that city. Upon his leaving France, he retired to Sicily, where he was received by Frederick king of Arragon with the greateſt marks of kindneſs and eſteem. Some time afterwards, this prince ſent him to France, to attend Pope Clement in an illneſs; and he was ſhipwrecked on the coaſt of Genoa, about the year 1313. The works of Arnaud, with his life prefixed, were printed in one volume folio, at Lyons, in 1520—and at Baſil in 1585, with the notes of Nicholas Tolerus.

ARNAUT LAROS. See ALBANIA, N° 2.

ARNAUTS, cavalry belonging to the Grand Seignior.

ARNAY-LE-DUC, a town of France, in the department of Cote d'Or, which carries on a pretty good trade. It is ſeated in a valley near the river Arroux, 25 miles NW. of Baune. Lon. 4° 26. E. Lat. 47. 7. N.

ARNCOT, a ſmall town in Oxfordſhire, near Amerſden and Bicester.

ARNDAL, a ſmall town, but a large landing place of Chriſtianſand, in Norway, ſeated on a rock in the middle of the river Nid. It has ſeveral iron mines near it.

ARNDT, John, a famous Proteſtant divine of Germany, born at Ballenſtad, in the duchy of Anhalt, in 1555. At firſt he applied to the ſtudy of phyſic; but falling into a dangerous ſickneſs, he made a vow to change his profeſſion for that of divinity, if he ſhould be reſtored to health; which he accordingly did upon his recovery. He was miniſter firſt at Quedlinburg and then at Brunſwick. He met with great oppoſition in this laſt city: his ſucceſs as a preacher raiſed the emnity of his brethren. They aſcribed a variety of errors to him; and perſecuted him to ſuch a degree, that he was obliged to leave Brunſwick, and retire to Iſleb, where he was miniſter for 3 years. In 1611, George Duke of Lunenburg, who had a high opinion of his integrity and ſanctity, gave him the church of Zell, and appointed him ſuperintendant of all the churches in the duchy of Lunenburg; which office he diſcharged for 11 years, and died in 1621. He wrote in High Dutch, A treatiſe on true Chriſtianity, which has been tranſlated into ſeveral languages.

ARNE, Dr Thomas Auguſtine, diſtinguiſhed by his ſkill in muſic, was the ſon of Mr Arne, an upholſterer in Covent Garden, whom Addiſon is ſuppoſed to have characteriſed in N° 155 and N° 160 of The Tatler; and brother of Mrs Cibber the player. He was early devoted to muſic, and ſoon became eminent in his profeſſion. In July 6, 1759, he had the degree of doctor of muſic conferred on him at Oxford. His compoſitions are univerſally applauded, and he was alſo particularly ſkilful in inſtructing vocal performers. He died March 5, 1778, having written the following o-

peras: *Artaxerxes*, in 1762; *The Guardian outwitted*, 1764, and *The Rose*, in 1778.

ARNEBERG, a town of Brandenburg, seated on the Elbe, between Angermund and Werben, 3 miles distant from each. It was taken from the Swedes in 1631, and is now subject to Prussia.

ARNEDO, a town in S. America, in Peru, with a good harbour, 25 miles N. of Lima.

ARNEFONT, a village of Angus-shire, in the parish of Glammis, which has about 80 inhabitants.

ARNEHEIM. See ARNHEIM.

ARNGASK, a parish of Scotland, situated in, or rather comprehending a part of, 3 different counties, which meet in it, viz. Fifeshire on the E. Perthshire on the W. and NW. and Kinross-shire on the S. It contained in 1790, by Mr Lang's report to Sir John Sinclair, 123 houses and 554 inhabitants, which is 18½ fewer than in 1755. The soil is various, and the climate salubrious.

ARNHALE, a small town in Warickshire.

ARNHALL, a district of Mearns-shire, in the parish of Fettercairn.

ARNHEIM, or ARNEHEIM, a town of the United Provinces, in Guelderland, capital of Veluive, seated on the Rhine, 8 miles N. of Nimeguen, and 12 E. by S. of Utrecht. It is adorned with several fine churches, particularly that of St Walburg and of St Eusebius; which last has a very high tower. The town has five gates, and several fine ramparts, part of which are washed by the Rhine, and the other parts have wide and deep ditches about them. There is a canal between this place and Nimeguen, made at the expence of both towns, on which boats pass backwards and forwards to carry on trade. The air is very healthful. Lon. 5. 55. E. Lat. 52. 6. N.

ARNHUSEN, a small town of Pomerania near the Riga, 4 leagues from Colberg and the Baltic.

ARNI. See ARNA.

ARNICA. LEOPARDS BANE, in botany, a genus of the polygamia superflua order, belonging to the syngenesia class of plants; and in the natural method ranking under the 49th order, *Compositæ-discoides*. The receptacle is naked; the pappus is simple; and the filaments are five, without antheræ. There are 7 species all natives, of Ethiopia, except the two following:

1. ARNICA MONTANA, with oval leaves, grows naturally on the Alps, and also upon many of the high mountains in Germany, and other cold parts of Europe. The roots of this species, when planted in a proper soil and situation, spreads very far under the surface, and put out many entire oval leaves, from between which the flower-stems arise, which grow about a foot and an half high. The top is terminated by a single yellow flower, composed of many florets, like those of the dandelion. These are succeeded by oblong seeds, which are covered with down. This plant delights in a moist shady situation, and may be propagated by parting the roots, in autumn when the stalks begin to decay; or by the seeds sown in autumn soon after they are ripe, for those sown in spring often fail. It has an acrid bitter taste, and when bruised, emits a pungent odour, which excites sneezing. On this account the country people in some parts of Germany use it as snuff, and smoke it like tobacco. It was formerly represented as a remedy of great efficacy against effusions and suffusions of blood, from falls, bruises, or the like; and it was then also mentioned as a remedy in jaundice, gout, nephritis, &c. but in these affections it is now very little, if at all, employed. Of late it has been principally recommended in paralytic affections, and in cases where a loss or diminution of sense arises from an affection of the nerves, as in instances of amaurosis. In these it has chiefly been employed under the form of infusion. From a dram to half an ounce of the flowers has been directed to be infused in a pint of boiling water, and taken in different doses in the course of the day: sometimes it produces vomiting, sometimes sweating, sometimes diuresis; but frequently its use is attained with no sensible operations, unless it can be considered as such, that in some cases of paralysis, the cure is said to be preceded by a peculiar prickling, and by shooting pains in the affected parts. It has also been of late represented as a very powerful antispasmodic; and to have been successfully employed in fevers, particularly those of the intermittent kind, and in cases of gangrene. In those diseases it has been said to prove as efficacious as the Peruvian bark, in the form of a pretty strong decoction taken in small doses frequently repeated, or in that of an electuary with honey. Its real influence however still remains to be determined by future observations; but is one of those active substances from which something may be expected.

2. ARNICA SCORPIOIDES, with sawed leaves growing alternately, is a native of Bohemia and Siberia. The roots of this sort are much jointed, and divided into many irregular fleshy off-sets, which are variously contorted; from whence some superstitious persons have imagined that they would expel the poison of scorpions, and cure the wounds made by the sting of that animal. This species is propagated like the other. Both are very hardy, and require only to be kept free from weeds.

ARNIFORD, LOCH, a harbour of Scotland, in the parish of Duirnish, in the Isle of Sky.

ARNIS, an island of Slesvick.

ARNISÆUS, Henningus, a philosopher and physician of great reputation, about the beginning of the 17th century. He was born at Halberstad in Germany, and was professor of physic in the university of Helmstad. The most remarkable of his works are, 1. *De authoritate principum in populum semper inviolabili*, in which he maintains that the authority of princes ought not to be violated; 2. *De jure majestatis libri tres*, and *Reflectiones politicæ*, all printed at Francfort, in 1610, 1612, and 1615. He was invited to Denmark, and was made counsellor and physician to the king. He travelled into France and England, and died in November 1635. He wrote also several philosophical, medicinal, and political treatises.

(1.) ARNO, a large and rapid river of Italy, in Tuscany, which it divides, and in its course washes Florence and Pisa; rising in the Appennines, to the east of Florence, near a village called *S. Maria della Gratie*, on the borders of Romagna, 15 miles to the west of the sources of the Tiber; and then turning southward towards Arretium, it is there increased by the lakes of the Clanis; after which it runs westward, dividing Florence into two parts,

and

and at length waſhing Piſa, falls 8 miles below it into the Tuſcan Sea.

(2.) ARNO, a pleaſant valley of Italy, through which the ARNO (N° 1.) runs, and which abounds in all kinds of fruits. Part of it is thought to have been formerly a lake, before the Arno made its paſſage through the rock at Rignano. The bones of elephants are found in digging, through its ſtrata, which are very regular.

ARNOBIUS, profeſſor of rhetoric at Sicca, in Numidia, towards the end of the 3d century. Being bred up a Pagan, he at firſt oppoſed Chriſtianity: but in conſequence of certain dreams, he became deſirous of embracing it. For this purpoſe he applied to the biſhops to be admitted into the church. But they had ſome diſtruſt of him, and before they would admit him, inſiſted on ſome proofs of his ſincerity. In compliance with this demand, he wrote againſt the Gentiles; wherein he refuted the abſurdities of their religion, and ridiculed their falſe gods. In this treatiſe he has employed all the flowers of rhetoric, and diſplayed great learning: but from an impatience to be admitted into the body of the faithful, he is thought to have been in too great a hurry in compoſing his work, and not having exact knowledge of the Chriſtian faith, he publiſhed ſome very dangerous errors. Mr Bayle remarks, that his notions about the original of the ſoul, and the cauſe of natural evil, and ſeveral other important points, are highly pernicious. St Jerom, in his epiſtle to Paulinus, is of opinion that his ſtyle is unequal and too diffuſe, and that his book is written without method; but Dr Cave thinks this judgment too ſevere, and that Arnobius wants neither elegance nor order in his compoſition. Voſſius ſtyles him *the Varro of the eccleſiaſtical writers*. Du Pin obſerves, that his work is written in a manner worthy of a profeſſor of rhetoric: the turn of his ſentiments is very oratorical; but his ſtyle is a little African, his expreſſions being harſh and inelegant. We have ſeveral editions of his work againſt the Gentiles; one publiſhed at Rome in 1542, others at Baſil, Paris, and Antwerp; and one at Hamburg in 1610, with notes by Gerhard Elmenhorſtius. He wrote alſo a piece intitled *De rhetoricæ inſtitutione*; which is not extant.

ARNODI, in antiquity, [from ἀρνὸς, a lamb, which was their uſual reward, and ᾠδὴ, ſong, or ſinging,] the RHAPSODI, or public ſingers in Greece.

(1.) ARNOLD, a native of Breſcia, in Italy, diſtinguiſhed himſelf by being the founder of a ſect which oppoſed the wealth and power of the Romiſh clergy. He went into France, where he ſtudied under the celebrated Peter Abelard. Upon his return to Italy, he put on the habit of a monk, and opened his invectives in the ſtreets of Breſcia. The people crowded round him. He told them he was ſent to reform abuſes, to pull down the proud and to exalt the humble. He then pointed out his declamation againſt the biſhops, againſt the clergy, againſt the monks, and finally againſt the Roman pontiff himſelf; to the laity only he was indulgent. "Churchmen, ſaid he, no hold benefices, biſhops who have domains, and monks that have poſſeſſions, will all be damned." His hearers ſhouted approbation. "Theſe things, continued he, belong to the prince; he may give them to whom he pleaſes, but he muſt give them to the laity. It is on their tithes, and the voluntary contributions of the people, that thoſe ſons of God muſt live: they muſt be frugal, continent, and mortified."—The church of Breſcia was ſoon thrown into the greateſt confuſion, and the people, already prejudiced againſt their miniſters, threatened to overturn their altars. The ſacred writings he urged in ſupport of his aſſertions, and from them he denounced the vengeance of Heaven againſt the violators of the law. Indeed, nothing could be more glaringly offenſive than the oſtentatious parade of the biſhops and great abbots, and the ſoft and licentious lives of the monks and clergy. A grand council was held at Rome, in 1139; Arnold was cited to appear before it. His accuſers were the biſhop of Breſcia, and many others, whom he had ridiculed and inſulted. From ſuch judges he could not look for much indulgence. He was found guilty, and ſentenced to perpetual ſilence. Upon this he left Italy, croſſed the Alps, and found a refuge in Zurich. Though Arnold had quitted Italy, yet had his opinions taken deep root, and Rome itſelf was infected by them. Irritated by the conduct of their maſter Innocent II. the Roman people aſſembled in the Capitol. It was propoſed that the power of the pontiff, which they called exorbitant, ſhould be reſtrained: this was carried: when ſuddenly, inſpired as it were by the genius of the place, they moved that the ſenate, which for years had been aboliſhed, ſhould be reſtored. The propoſition was received with the loudeſt acclamations. Innocent in vain oppoſed the bold deſign; there was a magic in it which ſpread irreſiſtibly, and for a moment ſeemed to rouſe the fallen ſpirit of the nation. The pope viewed with horror the reverſe of fortune which threatened the tiara; to be ſhorn of his mighty power, and to become the mere ſhepherd of the Chriſtian people, was a thought too afflicting; he fell ſick and died. Under his ſucceſſors Celeſtine and Lucius, whoſe reigns were but of a few months, the Romans purſued their darling object. They waited on the latter, and, in an imperious tone, demanded the reſtitution of all the honours and civil rights which had been uſurped from the people. The prince of the ſenate, ſaid they, whom we have choſen, will beſt adminiſter the important truſt: the tithes and offerings of the faithful will ſufficiently anſwer all the exigencies of your holineſs: it was thus that our ancient biſhops lived.—Lucius ſurvived this event but a few days. His ſucceſſor was Eugenius III. the friend and diſciple of the renowned Bernard. The night before his conſecration the ſenators aſſembled, and it was agreed, that either he ſhould ſolemnly confirm all their proceedings, or they would annul his election. This reſolution was notified to him. He called together his friends; and it was their advice, that he ſhould neither accede to their extravagant demand, nor expoſe himſelf, by a refuſal, to the fury of the populace. He therefore ſilently withdrew from Rome, and retired to a neighbouring fortreſs. Arnold, who, in baniſhment, had contemplated the effect of his admonitions on the minds of the Romans, and the ſucceſs

which ſeemed to follow their exertions, was now informed that the pope had retired, and that the gates of the capitol were open to receive him: it was likewiſe ſuggeſted to him, that his preſence was more than ever neceſſary, to give energy to their reſolves, form to their plans, and ſtability to their undertakings. Arnold took fire at the news; an unuſual ſwell of enthuſiaſm filled his breaſt; and he fancied that, like Junius Brutus, he was called at once to give liberty to Rome. At his appearance a new ſtream of vigour animated the citizens; they called him their friend and deliverer. The Breſcian walked amongſt them; his deportment was humble, his countenance emaciated, his addreſs affable, and he ſpoke to them of moderation, of ſubmiſſion, of obedience. With the nobles and new ſenators alſo he was mild and diffident, ſpeaking much of virtue and of reſpect for religion and the laws. But no ſooner was he ſenſible of his own real influence, and ſaw the lengths to which the revolters had carried their deſigns, than he harangued the people; he talked of their forefathers the ancient Romans, who, by the wiſdom of the ſenate and the valour of their armies, had conquered nations and ſubdued the earth: He dwelt on the names and the atchievements of the Bruti, the Gracchi, and the Scipios; and of theſe men, ſaid he, are you not the children? He adviſed, that the capitol be inſtantly repaired; that the equeſtrian order be reſtored; that the people have their tribunes; that dignity attend the ſenate; and that the laws, which had been ſilent and neglected, be revived in all their vigour. He ſpoke of the pope as of a depoſed and baniſhed tyrant: "But ſhould you again be diſpoſed (continued he) to admit him within theſe walls; fix your own rights and determine his. He is but your biſhop; let him therefore have his ſpiritual juriſdiction. The government of Rome, its civil eſtabliſhments, and its territories belong to you. Theſe you will keep if you have the ſpirit of men and the hearts of Romans." Fired by this harangue, the people, headed by the moſt diſaffected nobles, attacked the few cardinals and churchmen who remained in the city; ſet fire to the palaces; and compelled the citizens to ſwear obedience to the new government. Moderate men were ſhocked at theſe exceſſes, but it was in vain to oppoſe the torrent: they ſubmitted, looking forward, with ſome curioſity, to the termination of an event which had begun in extravagance, and could not but end in diſappointment. Eugenius till now viewed, with concern, the wild derangement of the people: but when it ſeemed that their eyes were opened to their own exceſſes, he could be inactive no longer. He excommunicated the ringleaders of the faction; and at the head of his troops marched againſt the enemy. His friends within the city, who were numerous co-operated with his deſigns, and in a few days overtures for peace were made to the pontiff. He acceded to them, but on condition that they ſhould annul the arrangements they had made, and if they would have ſenators, that they ſhould acknowledge all their power was from him. The people were ſatisfied, and they threw open the gates, through which Eugenius entered, among the acclamations of a fawning and inconſtant multitude. —Before this event Arnold had retired; but he left behind him many friends ſtrongly attached to his perſon and principles. Of himſelf we hear little more till the reign of Adrian our countryman; when, on account of freſh tumults, he and his adherents were excommunicated, and Rome was threatened with an interdict unleſs they expelled the whole party from their walls. This they did. The Arnoldiſts retired with their champion into Tuſcany, where he was received as a prophet and honoured as a ſaint. His enemies, however, prevailed: he was made priſoner, and conducted under a ſtrong eſcort to Rome. In vain was great intereſt made to ſave his life; he was condemned to the ſtake, and executed, and his aſhes thrown into the Tiber, leſt the people ſhould collect his remains and venerate them as the relics of a ſainted martyr.—Mr Berington, in his lives of Abelard and Heloiſa, deſcribes Arnold, as "a man whoſe character, whoſe principles, and whoſe views, we perhaps ſhould be diſpoſed to admire, had his life been recorded by unprejudiced hiſtorians, and not brought down to us drawn in the blackeſt colours which party, bigotted zeal, and enthuſiaſm, could lay on. He was raſh, miſjudging, and intemperate, elſe he never would have engaged in ſo unequal a conteſt. —The view of ſuch a phenomenon in the 12th century excites a pleaſing admiration. To attack the Roman pontiff and his clergy in the very centre of their power, required a more than common ſhare of fortitude; to adopt a ſettled ſcheme of reſtoring to its priſtine glory the republic of Rome, demanded a ſtretch of thought comprehenſive and enterpriſing; and to forego the eaſe and indulgence of a diſſipated age, for the reformation of manners and the ſuppreſſion of what he thought uſurped dominion, argued a character of more diſintereſted, generous, and benevolent. But Arnold, like other reformers, went too far; and paſſion ſoon vitiated undertakings which were begun perhaps with motives the moſt laudable—The readineſs with which the Roman people embraced this plan of lowering the juriſdiction of the pontiff, and reſtraining it within thoſe bounds which the true ſpirit of Chriſtianity had fixed, at once ſhows that they could reaſon juſtly, and that they conſidered the unbounded ſway of the triple crown, to which reluctantly they ſubmitted, as an aſſumed prerogative, to which violence or miſconſtruction, and not Chriſtian right, had given efficacy."

(2.) ARNOLD, Benedict, an American general, whoſe fortune and character was ſingular. He was born in New England, and bred a ſurgeon, but gave up this profeſſion for a ſea life; and was for a number of years maſter and ſupercargo of a trading veſſel. When hoſtilities between Great Britain and the colonies commenced, he took part with his native country, and was choſen captain of a company of volunteers at New-haven. He ſoon after roſe to the rank of colonel, and commanded an expedition to Canada. Deſigning to take Quebec by ſurpriſe, he conducted his troops through very great difficulties, but the garriſon having had timely notice, was fully pre-

ed. Montgomery joining him ſoon after, they attempted to ſtorm the city, in which he received a wound in the leg; and on the death of General *Montgomery*, he retired with his troops to Crown Point. He afterwards commanded a flotilla on Lake Champlain, in which he diſtinguiſhed himſelf by his bravery. He continued actively employed on the American ſide, till 1780, when he began a correſpondence with Sir Henry Clinton for betraying Weſt Point to the Britiſh; in which unfortunate negociation Major André became a victim. *Arnold* himſelf narrowly eſcaped to an Engliſh ſhip of war. He now ſhowed equal ardour on the Britiſh ſide; and at the end of the war retired to *England*, where he had a penſion. Some time after he went to Nova Scotia, from whence he ſailed for the Weſt Indies, but was taken by the French, from whom he made his eſcape. He died in London in 1801.

(3.) ARNOLD, Samuel, an eminent compoſer of muſic, was educated at the Chapel-royal, St James's, under Mr Gates and Dr Nares. About 1760 he became compoſer to Covent Garden theatre, and the pieces he there produced were much admired. His *Cure for Saul* brought crowded houſes; and ſtill more did the *Prodigal Son*, an oratorio, for which the degree of Doctor was conferred on him at Oxford, in 1773. He was then proprietor of the Marybone gardens, at that time famous for public amuſement. When Dr Nares died, in 1783, Arnold was appointed organiſt and compoſer to the Chapel Royal. In 1786, he began an elegant edition of Handel's works. He died in October 1802, and was interred in Weſtminſter Abbey.

ARNOLDIA. See ARNALDIA.

ARNOLDISTS, in church hiſtory, a ſect ſo called from their leader. See ARNOLD, No. 1.

ARNOLDUS, Gothofredus, paſtor and inſpector of the churches of Perleberg, and hiſtoriographer to the king of Pruſſia, was born at Annaburg in the mountains of Miſnia in 1666. He was a zealous defender of the Pietiſts, a ſect among the German Proteſtants, and compoſed a great number of religious works; particularly an *Eccleſiaſtical Hiſtory*, which expoſed him to the reſentment of the divines; and another giving an account of the doctrines and manners from the firſt ages, in which he frequently animadverts upon Cave's primitive Chriſtianity. He died in 1714. Various are the opinions concerning Arnoldus in Germany; ſome of his own countrymen and profeſſion extolling him to the ſkies, as a ſaint of the laſt century, and ſetting an ineſtimable value upon his works; while others pronounce damnation upon him as an arch-heretic, and condemn his writings as heterodox.

ARNON, in ancient geography, a river that riſes in the mountains of Gilead, and runs SW. between the borders of the Moabites and Ammonites on the other ſide Jordon. Joſephus ſays it riſes on the borders of Arabia, and falls into the Dead Sea. It is alſo called the river of Gad, as appears from 2 Sam. xxiv. 5. compared with 4 Kings x. 33.

(1.) ARNOT, in botany, the Engliſh name of the bunium. See BUNIUM.

(2.) ARNOT, a ſmall river in Perthſhire, which runs through Glenfernat, and waters the diſtrict of Strathardle in the pariſh of Moulin.

(3.) ARNOT. ARNOTTA, N° 1.

(1.) ARNOTTA, or ARNOT, in botany, a name given by the peaſants of Burgundy, and many other places, to certain roots which they frequently turn up, from 5 to 6 inches depth, in plowing the ground. They carefully collect theſe, and eat them, after roaſting in the aſhes, or otherwiſe; by which ſort of cooking they acquire the taſte of a cheſnut, and are found to be a very wholeſome and nouriſhing food. They are blackiſh on the outſide, and white within, and are of the ſize of a ſmall walnut. They are common in the north of Scotland.

(2.) ARNOTTA, } the ſame with Anotta.
ARNOTTO, } See ANOTTA and BIXA.

ARNOULD, St, a town of France, in the department of Eure and Loire, in the foreſt of Iveline, on the road from Chartres to Paris.

ARNSHEIM, a town of Germany, in the palatinate of the Rhine, 8 miles from Crutzenach.

ARNSTADE, or } a town of Germany, in
ARNSTADT, } Thuringia, on the river Gera, 10 miles SW. of Erfort. Lon. 11. 5. E. Lat. 40. 54. N.

ARNULPH, or ERNULPH, biſhop of Rocheſter, in the reign of Henry I. He was born in France, where he was ſome time a monk of St Lucian de Beauvais. The monks led moſt irregular lives in this monaſtery, for which reaſon he reſolved to quit it; but firſt took the advice of Lanfranc archbiſhop of Canterbury, who invited him over to England, and placed him in the monaſtery of Canterbury, where he lived a private monk till Lanfranc's death. When Anſelm ſucceeded, Arnulph was made prior of the monaſtery of Canterbury, and afterwards abbot of Peterborough. In 1115, he was conſecrated biſhop of Rocheſter, which ſee he held nine years, and died in 1124, aged 84. He wrote, 1. A piece in Latin, entitled *Textus Roffenſis*, concerning the foundation, endowment, charters, laws, &c. of the church of Rocheſter: it is preſerved in the archives of that church. 2. An Epiſtle, in anſwer to ſome Queſtions of Lambert, abbot of Munſter; and, 3. An Epiſtle on inceſtuous Marriage.

ARNULPHIN, or } a coin of the value of a
ARNULPHINUS, } ducat and a half, current in ſome parts of France in the 15th century.

ARNWAY, John, a clergyman diſtinguiſhed by his benevolence and loyalty to king Charles I. was deſcended from a good family in the county of Salop, from which he inherited a conſiderable eſtate. He was educated at Oxford; and, having received holy orders, obtained the rectories of Hodnet and Ightfield, where he diſtinguiſhed himſelf by his piety and exemplary charity: for it was his cuſtom to clothe annually 12 poor people, and every Sunday to entertain as many at his table, not only plentifully, but with intimacy and reſpect. The civil war breaking out, he preached againſt rebellion, and raiſed and clothed eight troopers for the ſervice of king Charles I. upon which his houſe was plundered by the parliament's army.

He

He then went to Oxford, to ſerve the king in perſon, which ſubjected him to a new train of misfortunes: for his eſtate was ſoon after ſequeſtered, and himſelf impriſoned till the king's death; after which he went to the Hague, where he publiſhed, 1. The Tablet, or the Moderation of Charles I. the Martyr; and, 2. An Alarm to the Subjects of England. He at laſt went to Virginia, where he died in 1653.

AROBALIATCHI, a river of North America, which riſes in the country of the Chicaſaw Indians, to the weſt of Georgia, and after running ſouth, and being joined to the Yazoo and other rivulets, falls into the Miſſiſippi.

AROBAS, or AROBE, } by ſome ſpelt and pronounced ARROBE; in Spaniſh, ARROBAS; in the language of Peru, ARROU: a weight uſed in Spain, Portugal, Goa, Brazil, and in all Spaniſh America. All theſe arobes are ſcarcely like each other but in name, being very different in weight, and in proportion to the weights of other countries. The arobe of Madrid, and almoſt all over Spain, weighs twenty-five Spaniſh pounds.

AROER, in ancient geography, 1. a city, partly on the north bank, and partly in an iſland of the river Arnon. Sihon the Amorite took it from the Moabites; Moſes took it from him, and gave it to the tribe of Gad, who rebuilt it, Num. xxxii. 34. When the Gadites were carried captives to Aſſyria, the Syrians ſeem to have taken poſſeſſion of it; but were ſoon obliged to leave it to the Moabites, under whom the Aſſyrians ſeem to have rendered it a deſert, Iſa. xvii. 2. It had the ſame fate from the Chaldeans, under Nebuchadnezzar, Jer. xlviii. 20. 2. A city on the ſouth of Judah, to whoſe inhabitants David ſent part of the ſpoil which he took from the Amalekites, 1 Sam. xxx. 28. 3. A city near Rabbah of the Ammonites, Joſh. xiii. 25.

AROINT. *interj.* Avaunt! See AROYNT.

AROLEC, or AROLEO, } an American weight, equal to 25 pounds.

(1.) AROMA, [Lat ſpice.] flavour; fragrance.

(2.) AROMA is, by ſome authors, peculiarly applied to myrrh.

(3.) AROMA GERMANICUM, a denomination given by Platerus to elecampane; by others to juniper berries, on account of the great eſteem in which they are held by the Germans, for their ſpicy warm qualities; being by many preferred to ginger.

(4.) AROMA PHILOSOPHORUM, the aroph of Paracelſus. See AROPH, No 3.

AROMAIA, a province of New Andaluſia, in South America, on the Oroonoque.

AROMATA, in ancient geography, 1. a town of Lydia, famous for its generous wines; and hence the appellation. 2. A trading town and promontory of Ethiopia, at the termination of the Sinus Avalites of the Red Sea.

AROMATIC. See next article.

* AROMATICAL. *adj.* [from *aromatick.*] Spicy; fragrant; high ſcented.—All things that are hot and *aromatical* do preſerve liquors or powders. *Bacon.*

* AROMATICK. *adj.* [from *aroma*, Lat. ſpice.] 1. Spicy.—

Amidſt whole heaps of ſpices lights a ball,
And now their odours arm'd againſt them fly:
Some preciouſly by ſhatter'd porcelain fall,
And ſome by *aromatick* ſplinters die. *Dryden.*

2. Fragrant; ſtrong ſcented.—

Or quick effluvia darting through the brain,
Die of a roſe in *aromatick* pain. *Pope.*

(1.) * AROMATICKS. *n. ſ.* Spices. They were furniſhed for exchange of their *aromaticks*, and other proper commodities. *Raleigh.*

(2.) AROMATICS. See MATERIA MEDICA.

AROMATICUM VINUM. See VINUM.

AROMATICUS CALAMUS. See CALAMUS.

AROMATITIS, in ancient phyſiology, a kind of bituminous ſtone, by ſome repreſented as a gem, both in ſmell and colour reſembling myrrh. It is ſaid to be found in Arabia and Egypt, and to have been in great uſe among ladies, as a perfume.

* AROMATIZATION. *n. ſ.* [from *aromatize.*] The mingling of a due proportion of aromatick ſpices or drugs with any medicine.

* *To* AROMATISE. *v. a.* [from *aroma*, Lat. ſpice.] 1. To ſcent with ſpices; to impregnate with ſpices.—Drink the firſt cup at ſupper hot, and half an hour after ſupper, ſomething hot and *aromatized*. *Bacon.* 2. To ſcent; to perfume.—Unto converted Jews no man imputeth his unſavoury odour, as though *aromatized* by their converſation. *Brown.*

AROMATOPOLA, a dealer in ſpices; a druggiſt. *Bailey.*

ARON, the ark of the modern Jews. See ARK, N° I. § 5.

ARONA, a town of Italy, in the duchy of Milan, with a ſtrong caſtle, ſeated on the lake Maggiore. Upon an eminence, near the lake, there is a ſtatue in bronze, of St Barromeus, the patron of Milan, 35 ells high, upon a pedeſtal of 25 ells, making in all 60 ells in height. Lon. 8. 15. E. Lat. 45. 40. N.

ARONCHES, a town of Portugal, in Alentejo, on the confines of Spain on the Caro. It is well fortified, and has about 500 inhabitants.—Lon. 5. 16. W. Lat. 14. 39. N.

ARONDE, in fortification. See DOVETAIL, and QUEUE D'ARONDE.

AROOL, a town of Ruſſia, in the Ukrain, ſeated on the river Occa, 200 miles ſouth of Moſcow. Lon. 36. 40. E. Lat. 51. 58. N.

ARO ORCHIS, in botany. See GALANGAL.

(1.) AROPH, a contraction of AROMA PHILOSOPHORUM; a name given to ſaffron.

(2.) AROPH is alſo uſed to denote mandragora.

(3.) AROPH PARACELSI, a kind of chemical flowers, probably of the ſame nature with the *Ens Veneris*, elegantly prepared by ſublimation, from equal quantities of lapis hæmatitis and ſal ammoniac. Aroph is alſo uſed by Paracelſus, ſynonimouſly with *lithontriptic*.

ARORNOS, in botany, a name by which ſome authors have called the juniper.

AROSBAY, a town in the Eaſt Indies, on the coaſt of the iſland of Madura, near Java. Lon. 114. 30. E. Lat. 6. 30. S.

* AROSE. The preterite of the verb *ariſe*. See ARISE.

(1.) * AROUND. *adv.* [from *a* and *round.*] 1. In a circle.

He

He ſhall extend his propagated ſway,
Where Atlas turns the rowling heav'ns *around*,
And his broad ſhoulders with their lights are crown'd. *Dryden.*

2. On every ſide.—
And all above was ſky, and ocean all *around*. *Dryden.*

(2.) * AROUND. *prep.* About; encircling.—
From young Julus head
A lambent flame aroſe, which gently ſpread
Around his brows, and on his temples fed. *Dryden.*

AROURA, a Grecian meaſure of 50 feet. It was more frequently uſed for a ſquare meaſure of half the plethron. The Egyptian aroura was the ſquare of 100 feet.

* *To* AROUSE. *v. a.* [from *a* and *rouſe*.] 1. To wake from ſleep.—
How loud howling wolves *arouſe* the jades,
That drag the tragic melancholy night. *Shakeſ.*

2. To raiſe up; to excite.—
But abſent, what fanatick woes *arous'd*
Rage in each thought, by reſtleſs muſing fed,
Chill the warm cheek, and blaſt the bloom of life. *Thomſon.*

* AROW. *adv.* [from *a* and *row*.] In a row; with the breaſts all bearing againſt the ſame line.
But with a pace more ſober and more ſlow,
And twenty, rank in rank, they rode *arow*. *Dryden.*

* AROYNT. *adv.* [a word of uncertain etymology, but very ancient uſe.] Be gone; away: a word of expulſion, or avoiding.—
Saint Withold footed thrice the wold,
He met the night-mare, and her name told,
Bid her alight, and her troth plight,
And *aroynt* thee, witch, *aroynt* thee right. *Shakeſpeare.*

ARPAD, in ancient geography, is thought to have been a city of Syria. It was always placed with Hamath. 2 Kings, xix. 13. Iſa. x. 9. Jer. xlix, 23. Sennacherib boaſts of having reduced Arpad and Hamath, or of having deſtroyed the gods of theſe places. Hamath is the ſame with Arad or Arvad, as it is ſometimes called in Hebrew. See ARAD, N° 2.

ARPAGIUS, or HARPAGIUS, among the ancients, a child who died in the cradle, or in early youth. The word is formed from the Greek, ἁρπάζω, I ſnatch. The Romans made no funerals for their *arpagii*. They neither burnt their bodies, nor made tombs, monuments, or epitaphs for them. In after times it became the cuſtom to burn ſuch as had lived to the age of 40 days, and had cut any teeth; and theſe they called Ἁρπασθοὶ, or Ἁρπαγμοὶ, q. d. *rapti*, *raviſhed*. The uſage ſeems to have been borrowed from the Greeks; among whom, Euſtathius aſſures us, it was the cuſtom never to bury their children either by night or full day, but at the firſt appearance of the morning; and that they did not call their departure by the name of the *death*, but by a ſofter appellation, Ἥρπασε ἁρπαγὴν, importing that they were raviſhed by Aurora, or taken away to her embraces.

ARPEGGIO, [Ital.] in muſic, implies that the ſeveral ſounds of an accord ſhould be heard, not together, but one after another, beginning always with the loweſt.

ARPEN, or ARPENT, ſignifies an acre or furlong of ground; and, according to the old French account in domeſday-book, 100 perches make an arpent. The moſt ordinary acre, called *l' arpent de France*, is 100 perches ſquare: ſome account it but half an acre.

ARPHAXAD, the ſon of Shem and father of Selah. Arphaxad was born in A. M. 1658, a year after the deluge, and died A. M. 2096, at the age of 438. Gen. xi. 12, &c.

ARPI. See ARGOS HIPPIUM, N° 2.

(1.) ARPINAS, or ARPINO, a town of Naples, in the terra di Lavora, 8 miles N. of Aquina, and 50 ESE. of Rome. Lon. 13. 46. E. Lat. 41. 4. N.

(2.) ARPINAS, or ARPINO, Joſeph Cæſar, a famous painter, born in 1560, at the caſtle of ARPINAS. (N° 1.) He lived in great intimacy with Pope Clement VIII. who knighted him, and beſtowed on him many favours. In 1600, he went to Paris with cardinal Aldrobandin, legate to the French court on the marriage of Henry IV. who gave Arpinas many preſents, and created him a knight of St Michael. His colouring is thought to be cold, but there is ſpirit in his deſigns. What he painted of the Roman hiſtory is the moſt eſteemed of all his works. He died at Rome in 1640.

ARPINO. See ARPINAS, N° 1.

ARPINUM, in ancient geography, a town of the Volſci, a little to the eaſt of the confluence of the rivers Liris and Fibrenus, in the Terra di Lavora; now decayed, and called ARPINO. It was the native place of Cicero, and of C. Marius.

ARQUA, a town of Italy, in the Paduan, a territory of Venice, remarkable for the tomb of Petrarch. It is 10 miles S. of Padua. Lon. 11. 43. E. Lat. 45. 43. N.

(1.) ARQUATA, in ornithology, the name of a bird, called alſo by ſome *numenius*, and commonly known in England by the name of the *curlew*. The male in this ſpecies is ſomewhat ſmaller than the female, and is called the jack curlew. It is of a very delicate taſte.

(2.) ARQUATA MINOR, in ornithology, the wimbrel.

ARQUATUS MORBUS, a name given by ſome authors to the jaundice from its reſembling the colours of the rainbow, *arcus cæleſtis*.

ARQUEBUS. See ARQUEBUSE, and HARQUEBUS.

ARQUEBUS A CROC, is a ſort of ſmall fort arm, which carries a ball of about three half ounces; now only uſed in Old Caſtile.

(1.) ARQUEBUSADE, a ſhot of an arquebuſe.

(2.) ARQUEBUSADE, in medicine, a kind of water originally of French invention, recommended as uſeful in caſes of gun-ſhot wounds, from whence it derives its name. The compoſition of it is not generally known, but it is ſaid to be made from mint, ſage, mugwort, &c. and lime water diſtilled in wine. It is alſo called *aqua vulneraria*, *aqua ſclopetaria*, and *aqua catapultarum*.

* ARQUEBUSE. *n. ſ.* [Fr. ſpelt falſely *harquebuſe*.] A hand gun. It ſeems to have anciently meant much the ſame as our carabine, or fuſee.—A *harquebuſe*, or ordnance, will be farther heard from the mouth of the piece, than backwards or on the ſides. *Bacon.*

* ARQUEBUSIER.

* ARQUEBUSIER. *n. f.* [from *arquebuſe.*] A ſoldier armed with an arquebuſe.—He compaſſed them in with fifteen thouſand *arquebuſiers*, whom he had brought with him well appointed. *Knolles.*

(1.) ARQUES, a river of France. See N° 2.

(2.) ARQUES, a town of France, in the department of the Lower Seine, ſeated on the river, (N° 1.) 4 miles SE. of Dieppe, and 4 NE. of Longueville. Lon. 1. 13. E. Lat. 49. 53. N.

ARQUIS, or ARQUITE, [O. Lat.] an archer.

ARR, *n. f.* a ſcar. *Bailey.*

ARRACENI, the ancient Saracens. See ARABIA, § 2.

(1.) * ARRACH, ORRACH, or ORRAGE. *n. f.* One of the quickeſt plants both in coming up and running to ſeed. Its leaves are very good in pottage. *Mortimer's Huſbandry.*

(2.) ARRACH. See ATRIPLEX.

ARRACHEE, in heraldry, a term applied to the repreſentations of plants torn up by the roots.

ARRACHIS, in botany. See ARACHIS.

ARRACIF, a ſmall harbour of Pernambuco, in Brazil; much choked up with ſand. Lon. 35. 10. W. Lat. 8. 20. S.

(1.) * ARRACK, or ARACK. *n. f.* The word *arack* is an Indian name for ſtrong waters of all kinds; for they call our ſpirits and brandy Engliſh *arack.*—But what we underſtand by the name *arack*, is no other than a ſpirit procured by diſtillation from a vegetable juice called toddy, which flows by inciſion out of the cocoa-nut tree. *Chambers.*

(2.) ARRACK. See ARACK, N° I. § 1—4.

(1.) ARRAGON, a province of Spain, bounded on the N. by the Pyrenean mountains, which ſeparate it from France; on the W. by Navarre and the two Caſtiles; on the S. by Valencia; and on the E. by Catalonia. It is 180 miles long, and 149 broad; but the land is mountainous, dry, ſandy, and ſtony, badly cultivated, and worſe peopled. Its principal rivers are the Ebro, which croſſes it in the middle, the Xalo, the Cinea, the Galego, and the Arragon. The air is pure and wholeſome; and there are mines of iron, and ſome ſay of gold. The moſt fertile parts are about the rivers; where the land produces corn, wine, oil, flax, hemp, various fruits, and a ſmall quantity of ſaffron; beſides feeding large flocks of ſheep, and plenty of game in the woods. Saragoſſa is the capital of this province; and the other chief towns are Balbaſtro, Jaca, Sarazona, Haeſca, Calatajud, Albarrazin, Trevel, Daroca, and Boria.

(2.) ARRAGON, a river in ARRAGON, N° 1.

ARRAGONESE, the people of Arragon, have the character of being bold, courageous, and well-bred; but poſitive in their opinions, and bigotted in their religion. They were the firſt of the Spaniards that threw off the Mooriſh yoke.

ARRAIATIO PEDITUM, the ranging or arraying of foot ſoldiers.

* *To* ARRAIGN. *v. a.* [*arranger*, Fr. to ſet in order.] 1. To ſet a thing in order, or in its place. One is ſaid to *arraign* a writ in a country, that fits it for trial before the juſtices of the circuit.—A priſoner is ſaid to be *arraigned*, where he is indicted and brought forth to his trial. *Cowel.* 2. To accuſe; to charge with faults in general, as in controverſy, in a ſatire.—

Reverſe of nature! ſhall ſuch copies then
Arraign th' originals of Maro's pen? *Roſcom.*

3. It has *for* before the fault.—My own enemies I ſhall never anſwer; and if your lordſhip has any, they will not *arraign* you *for* want of knowledge. *Dryden.*

(1.) * ARRAIGNMENT. *n. f.* [from *arraign.*] The act of arraigning; an accuſation; a charge.—In the ſixth ſatire, which ſeems only an *arraignment* of the whole ſex, there is a latent admonition to avoid ill women. *Dryd. n.*

(2.) ARRAIGNMENT, in law, the arraigning or ſetting a thing in order, as a perſon is ſaid to arrarign a writ of novel diſſeſin, who prepares and fits it for trial. The word is moſt properly uſed to call a perſon to anſwer in form of law upon an indictment, &c. When brought to the bar, the criminal is called upon by name to hold up his hand; which, though it may ſeem a trifling circumſtance, yet is of this importance, that by the holding up of his hand *conſtat de perſona*, and he owns himſelf to be of that name by which he is called. However it is not an indiſpenſable ceremony; for, being calculated merely for the purpoſe of identifying the perſon, any other acknowledgment will anſwer the purpoſe as well: therefore, if the priſoner obſtinately and contemptuouſly refuſes to hold up his hand, but confeſſes he is the perſon named, it is fully ſufficient. Then the indictment is to be read to him diſtinctly in the Engliſh tongue (which was done even when all other proceedings were in Latin), that he may fully underſtand his charge. After which it is to be demanded of him, whether he be guilty of the crime whereof he ſtands indicted, or not guilty? When a criminal is arraigned, he either ſtands mute or confeſſes the fact, or elſe he pleads to the indictment. I. If he ſays nothing, the court ought *ex officio* to impannel a jury to inquire whether he ſtands obſtinately mute, or whether he be dumb *ex viſitatione Dei.* If the latter appears to be the caſe, the judges of the court (who are to be of counſel for the priſoner, and to ſee that he hath law and juſtice) ſhall proceed to the trial, and examine all points as if he had pleaded *not guilty.* But whether judgment of death can be given ſuch a priſoner, who hath never pleaded, and can ſay nothing in arreſt of judgment, is a point yet undetermined. If he be found to be obſtinately mute (which a priſoner hath been held to be that hath cut his own tongue), then, if it be on an indictment of high treaſon, it hath long been clearly ſettled, that ſtanding mute is equivalent to a conviction, and he ſhall receive the ſame judgment and execution. The Engliſh judgment of penance for ſtanding mute was as follows: That the priſoner be remanded to the priſon from whence he came, and put into a low, dark chamber: and there be laid on his back, on the bare floor, naked, unleſs where decency forbids; that there be placed upon his body as great a weight of iron as he could bear, and more; that he have no ſuſtenance, ſave only, on the firſt day, three morſels of the worſt bread; and, on the ſecond day, three draughts of ſtanding water that ſhould be neareſt to the priſon-door; and in this ſituation this ſhould be alternately his daily diet, *till he dies* or,

or, as anciently the judgment ran, *till he anſwered*. It hath been doubted whether this puniſhment ſubſiſted at the common law, or was introduced in conſequence of the ſtatute Weſtm. 1. 3 Edw. I. c. 12. which ſeems to be the better opinion. For not a word of it is mentioned in Glanvil or Bracton, or in any ancient author, caſe or record (that hath yet been produced), previous to the reign of Edward I. but there are inſtances on record in the reign of Henry III. where perſons accuſed of felony, and ſtanding mute, were tried in a particular manner, by two ſucceſſive juries, and convicted; and it is aſſerted by the judges in 8 Henry IV. that, by the common law before the ſtatute, ſtanding mute on an appeal amounted to a conviction of the felony. This ſtatute of Edward I. directs ſuch perſons, "as will not put themſelves upon inqueſts of felonies before the judges at the ſuit of the king, to be put into hard and ſtrong priſon *(ſoient mys en la priſone fort et dure)*, as thoſe which refuſe to be at the common law of the land." And, immediately after this ſtatute, the form of the judgment appears in Fleta and Britton to have been only a very ſtrait confinement in priſon, with hardly any degree of ſuſtenance; but no weight is directed to be laid upon the body, ſo as to haſten the death of the miſerable ſufferer: and indeed any ſurcharge of puniſhment on perſons adjudged to penance, ſo as to ſhorten their lives, is reckoned by Horne in the Mirror as a ſpecies of criminal homicide. It alſo clearly appears, by a record of 31ſt Edward III. that the priſoner might then poſſibly ſubſiſt for 40 days under this lingering puniſhment. It is therefore imagined that the practice of loading him with weights, or, as it is uſually called, *preſſing him to death*, was gradually introduced between 31 Edward III. and 8 Henry IV. at which laſt period it firſt appears upon the books; being intended as a ſpecies of mercy to the delinquent, by delivering him the ſooner from his torment: and hence it is alſo probable, that the duration of the penance was then firſt altered; and inſtead of continuing *till he anſwered*, it was directly to continue *till he died*, which muſt very ſoon happen under an enormous preſſure. The uncertainty of its original, the doubts that were conceived of its legality, and the repugnance of its theory (for it was rarely carried into practice) to the humanity of the laws of England, all concurred to require a legiſlative abolition of this cruel proceſs, and a reſtitution of the ancient common law; whereby the ſtanding mute in felony, as well as in treaſon and in treſpaſs, amounted to the confeſſion of the charge. II. If the priſoner made a ſimple and plain confeſſion, the court hath nothing to do but to award judgment: but it is uſually very backward in receiving and recording ſuch confeſſion, out of tenderneſs to the life of the ſubject; and will generally adviſe the priſoner to retract it, and, III. Plead to the indictment; as to which, ſee the article PLEA OF INDICTMENT.

ARRAITORES. See ARRAY, and ARRAYERS.

(1.) ARRAN, a mountainous iſland of Scotland, in the Frith of Clyde, between Kintyre and Cunningham; 23 miles in length and 12 in breadth, according to Walker. But Mr Gerſhom Stewart, miniſter of Kilbride in Arran, in the Statiſtical account of his pariſh, ſtates the breadth of the iſland at only *ſeven* miles. If he means Scots miles, the eſtimates are nearly equal. The beſt deſcription of this iſland is the following (§ 2, 3, and 4.) given by Mr Pennant in his Tour, Vol. II.

(2.) ARRAN, ANCIENT HISTORY OF. "Arran, or properly *Arr-ian*, or 'the iſland of mountains,' ſeems not to have been noticed by the ancients, notwithſtanding it muſt have been known to the Romans, whoſe navy, from the time of Agricola, had its ſtation in the *Glota Æſtuarium*, or the Frith of Clyde. Camden indeed makes this iſland the GLOTA of Antonine, but no ſuch name occurs in his Itinerary: it therefore was beſtowed on Arran by ſome of his commentators. By the immenſe cairns, the vaſt monumental ſtones, and many relics of Druidiſm, this iſland muſt have been conſiderable in very ancient times. Here are ſtill traditions of the hero FINGAL, or Fin-mac-coul, who is ſuppoſed here to have enjoyed the pleaſures of the chace: and many places retain his name: but I can diſcover nothing but oral hiſtory that relates to the iſland till the time of Magnus the Barefooted, the Norwegian victor, who probably included Arran in his conqueſt of Kintyre. If he did not conquer that iſland, it was certainly included among thoſe that Donald Bane was to cede: for it appears that Acho, one of the ſucceſſors of Magnus, in 1263, laid claim to Arran, Bute, and the Cumrays, in conſequence of that promiſe: the two firſt he ſubdued, but the defeat he met with at Largs ſoon obliged him to give up his conqueſts. Arran was the property of the crown. Robert Bruce retired thither during his diſtreſſes, and met with protection from his faithful vaſſals. Numbers of them followed his fortunes; and after the battle of Bannockburn he rewarded ſeveral, ſuch as the Mac-cooks, Mac-kinnons, Mac-brides, and Mac-louis, or Fullertons, with different charters of lands in their native country. All theſe are now abſorbed by this great family, except the Fullertons, and a Stewart, deſcended from a ſon of Robert III. who gave him a ſettlement here. In the time of the Dean of the Iſles, his deſcendant poſſeſſed Caſtle Douan; and *he and his bluid*, ſays the Dean, *are the beſt men in that countrey*. About the year 1334, this iſland appears to have formed part of the eſtate of Robert Stewart, great Steward of Scotland, afterwards Robert II. At that time they took arms to ſupport the cauſe of their maſter; who afterwards, in reward, not only granted at their requeſt an immunity from their annual tribute of corn, but added ſeveral new privileges, and a donative to all the inhabitants that were preſent. In 1456, the whole iſland was ravaged by Donald Earl of Roſs and Lord of the Iſles. At that period, it was ſtill the property of James II. but in the reign of his ſucceſſor James III. when that monarch matched his ſiſter to Thomas Lord Boyd, he created him Earl of Arran, and gave him the iſland as a portion. Soon after, on the diſgrace of that family, he cauſed the Counteſs to be divorced from her unfortunate huſband; and beſtowed both the lady and iſland on Sir James Hamilton, in whoſe family it continues to this time, a very few farms excepted."

(3.) ARRAN, EXTENT, ANIMALS, CLIMATE, &c.

&c. OF. "Arran is of great extent, being 23 miles from Sgreadan point north to Beinnean fouth; and the number of inhabitants are about 7000, who chiefly inhabit the coafts; the far greater part of the country being uninhabited by reafon of the vaft and barren mountains. Here are only two parifhes, Kilbride and Killmore; with a fort of chapel of eafe to each, founded in the laft century, in the golden age of this iflland, when it was bleffed with Anne Ducheff of Hamilton, whofe amiable difpofition and humane attention to the welfare of Arran render at this diftant time her memory dear to every inhabitant. The principal mountains of Arran are, Goatfield, or Gaoilbheinn, or "the mountain of the winds," of a height equal to moft of the Scottifh Alps, compofed of immenfe piles of moor-ftone, in form of wool-packs, clothed only with lichens and moffes, inhabited by eagles and ptarmigans; Beinbharrain, or "the fharp pointed;" Ceum-na-caillich, "the ftep of the carline or old hag;" and Grianan-Athol, that yields to none in ruggednefs. The lakes are, Loch-jorfa, where falmon come to fpawn; Loch-tana; Loch-nah-jura, on the top of a high hill; Loch-mhachrai; and Loch-knoc-a-charbeil, full of large eels. The chief rivers are, Abhan-mhor, Moina-mhor, Slondrai-machrei, and Jorfa; the two laft remarkable for the abundance of falmon. The quadrupeds are very few; only otters, wild-cats, fhrew-mice, rabbits, and bats: the ftags, which ufed to abound, are now reduced to about a dozen. The birds are, eagles, hooded-crows, wild pigeons, ftares, black game, grous, ptarmigans, daws, green plovers, and curlews. It may be remarked that the partridge at prefent inhabits this iflland, a proof of the advancement of agriculture. The climate is very fevere: for befides the violence of wind, the cold is very rigorous; and fnow lay here in the valleys for 13 weeks of the laft winter. In fummer, the air is remarkably falubrious; and many invalids refort here on that account, and to drink the whey of goats milk. The principal difeafe here is the pleurify: fmall-pox, meafles, and chincough, vifit the iflland once in feven or eight years. The practice of bleeding twice every year feems to have been intended as a preventative againft the pleurify: but it is now performed with the utmoft regularity at fpring and fall. The duke of Hamilton keeps a furgeon in pay; who at thofe feafons makes a tower of the iflland. On notice of his approach, the inhabitants of each farm aflemble in the open air? extend their arms; and are bled into a hole made in the ground, the common receptacle of the vital fluid. In burning fevers, a tea of *wood forrel* is ufed with fuccefs, to allay the heat. An infufion of *ramfons*, or *allium urfinum*, in brandy, is efteemed here a good remedy for the gravel."

(4.) ARRAN, INHABITANTS, AGRICULTURE, &c. OF. "The men are ftrong, tall, and well made; all fpeak the Erfe language, but the ancient habit is entirely laid afide. Their diet is chiefly potatoes and meal; and during winter, fome dried mutton or goat is added to their hard fare. A deep dejection appears in general through the countenance of all: no time can be fpared for amufement of any kind; the whole being given for procuring the means of paying their rent, of laying in their fuel, or getting a fcanty pittance of meat and clothing. The leafes of farms are 19 years. The fucceeding tenants generally find the ground little better than a *caput mortuum*: and for this reafon; fhould they at the expiration of the leafe leave the lands in a good ftate, fome avaricious neighbours would have the preference in the next fetting, by offering a price more than the perfon who had expended part of his fubftance in enriching the farm could poffibly do. This induces them to leave it in the original ftate. The method of fetting a farm is very fingular; each is commonly poffeffed by a number of fmall tenants; thus a farm of 40*l.* a-year is occupied by 18 different people, who by their leafes are bound, conjunctly and feverally, for the payment of the rent to the proprietor. Thefe live in the farm in houfes cluftered together, fo that each farm appears like a little village. The tenants annually divide the arable land by lot; each has his ridge of land, to which he puts his mark, fuch as he would do to any writing: and this fpecies of farm is called *run-rig*, i. e. ridge. They join in ploughing; every one keeps a horfe or more; and the number of thofe animals conſume fo much corn as often to occafion a fcarcity; the corn and peafe raifed being (much of it) defigned for their fubfiftence, and that of the cattle, during the long winter. The pafture and moor land annexed to the farm is common to all the poffeffors. All the farms are open. Inclofures of any form, except in two or three places, are quite unknown: fo that there muft be a great lofs of time in preferving their corn, &c. from trefpafs. The ufual manure is fea plants, coral and fhells. The run-rig farms are now difcouraged: but fince the tenements are fet by roup or auction, and advanced by an unnatural force to above double the old rent, without any allowance for inclofing, any example fet in agriculture, any fecurity of tenure by lengthening the leafes, affairs will turn retrograde, and the farms relapfe into their old ftate of rudenefs; migration will increafe (for it has begun), and the rents be reduced even below their former value: the late rents were fcarce 1200 l. a-year; the expected rents 3000 l.

(5.) ARRAN, LIVE STOCK, PRODUCE, &c. OF. "The live ftock of the iflland is 3183 milch cows; 2020 cattle, from one to three years old; 1058 horfes; 1500 fheep; and 500 goats: many of the two laft are killed at Michaelmas, and dried for winter proviſion, or fold at Greenock. The cattle are fold from 40 to 50 s. per head, which brings into the iflland about 1200 l. per annum: I think that the fale of horfes alfo brings in about 300 l. Hogs were introduced here only two years ago. The herring-fifhery round the iflland brings in 300 l. the fale of herring-nets 100 l. and that of thread about 300 l. for a good deal of flax is fown here. Thefe are the exports of the iflland; but the money that goes out for the neceffaries is a melancholy draw-back. The produce of the iflland is oats; of which about 5000 bolls, each equal to 9 Winchefter buſhels, are fown; 500 of beans, a few peas, and above 1000 bolls of potatoes, are annually fet: notwithftanding this, 500 bolls of oat meal are annually imported, to fubfift the natives. The women manufacture the wool [illegible] cloth"

cloathing of their families; they ſet the potatoes, and dreſs and ſpin flax. They make butter for exportation, and cheeſe for their own uſe. The inhabitants in general are ſober, religious and induſtrious; great part of the ſummer is employed in getting peat for fuel, the only kind in uſe here; or in building or repairing their houſes, for the badneſs of the materials requires annual repairs: before and after harveſt, they are buſied in the herring-fiſhery; and during winter the men make their herring-nets; while the women are employed in ſpinning their linen and woollen yarn. The light they often uſe is that of lamps. From the beginning of February to the end of May, if the weather permit, they are engaged in labouring their ground: in autumn they burn a great quantity of fern, to make kelp. So that, excepting at new-year's-day, at marriages, or at the two or three fairs in that iſland, they have no leiſure for any amuſements: no wonder then at their depreſſion of ſpirits. Arran forms part of the county of Bute, and is ſubject to the ſame ſort of government: but, beſides, juſtice is adminiſtered at the baron's baily court, who has power to fine as high as 20s. can decide in matters of property not exceeding 40 s. can impriſon for a month; and put delinquents into the ſtocks for three hours, but that only during day-time.

(6.) ARRAN, POPULATION OF. From the Statiſtical reports of Meſſrs Stewart and Hamilton, the miniſters of Kilbride and Kilmory, to Sir John Sinclair, it appears that the population of both theſe pariſhes has increaſed greatly within theſe 40 years; and that in 1793, the number of ſouls in the whole iſland amounted to 5804, and the total increaſe within that period to 2158. See KILBRIDE and KILMORY.

(II.) ARRAN, a town of Switzerland, ſeated on the Aar, 25 miles SW. of Baden. The Diets of the Proteſtant Cantons are held in it.

(III.) ARRAN, a village in the E. Riding of Yorkſhire, near Lund.

(IV.) ARRAN, NORTH, an iſland of Ireland, ſituated on the coaſt of Donegal in Ulſter. Lon. 8. 30. W. Lat. 55. 0. N.

(V.) ARRAN, SOUTH ISLES OF, three iſlands on the W. coaſt of Ireland, in the mouth of Galway Bay. Lon. 10. 0. W. Lat. 55. 0. N.

* *To* ARRANGE. *v. a.* [*arranger*, Fr.] To put in the proper order for any purpoſe.—

I chanç'd this day
To ſee two knights in travel on my way,
(A ſorry ſight:) *arrang'd* in battle new. *F. Queen.*

—How effectually are its muſcular fibres *arranged*, and with what judgment are its columns and furrows diſpoſed! *Cheyne.*

(1.) * ARRANGEMENT. *n. ſ.* [from *arrange.*] The act of putting in proper order; the ſtate of being put in order.—There is a proper *arrangement* of the parts in elaſtick bodies, which may be facilitated by uſe. *Cheyne.*

(2.) ARRANGEMENT, in philoſophy. The experiments of modern philoſophers have put it paſt a doubt that the diverſity of the colours of bodies depends entirely on the ſituation and arrangement of the parts, which reflect the light differently; the diverſity of taſtes and ſmells on the different arrangements of the pores, which render them differently ſenſible; and the general diverſity of bodies on the different arrangement of their parts.

(3.) ARRANGEMENT, in rhetoric has great effect. The happy arrangement of words makes one of the greateſt beauties of diſcourſe. See ORATORY.

* ARRANT. *adj.* [a word of uncertain etymology, but probably from *errant*, which being at firſt applied to its proper ſignification to vagabonds, as an *errant* or *arrant rogue*, that is, a *rambling rogue*, loſt, in time, its original ſignification, and being by its uſe underſtood to imply ſomething bad, was applied at large to any thing that was mentioned with hatred or contempt.] Bad in a high degree.—Country folks, who hallooed and hooted after me, as at the *arranteſt* coward that ever ſhewed his ſhoulders to the enemy. *Sidney.*—A vain fool grows forty times an *arranter* fot than before. *L'Eſtrange.*

And let him every deity adore,
If his new bride prove not an *arrant* whore.
Dryden.

* ARRANTLY. *adv.* [from *arrant.*] Corruptly; ſhamefully.—Funeral tears are as *arrantly* hired out as mourning clokes. *L'Eſtrange.*

(1.) ARRAS, a city of France, in the department of the Straits of Calais; formerly the capital of the ci-devant province of Artois. It is ſeated on a mountain; and the parts about it are full of quarries, where good ſtones are got for building. It is divided into two parts by a ſtrong wall, a large foſſe, and the rivulet Chrinchron, which, 100 paces below, falls into the Scarp. They are both well fortified, incloſed by high ramparts and deep foſſes, which in ſeveral places are cut out of the rock. Arras has 4 gates, and a ſtrong citadel with 5 baſtions. The moſt remarkable places are, the great ſquare where the principal market is kept, full of fine buildings, with piazzas all round it; the leſſer market, which contains the townhouſe, a very noble ſtructure, with a high tower covered with a crown, on the top of which is a brazen lion which ſerves for a vane. In the midſt of this market is the chapel of the Holy Candle, which the papiſts pretend was brought by the Virgin Mary herſelf above 600 years ago, when the city was affected with divers diſeaſes, and every one that touched the candle was cured! The candle is kept in a ſilver ſhrine. This chapel has a ſteeple, adorned with ſilver ſtatues. The cathedral church of Notre-Dame ſtands in the city. It is a very large Gothic building, extremely well adorned; the tower is very high, and has a fine cock embelliſhed with little figures in bronze, which repreſent our Saviour's paſſion, and paſs before the bell to ſtrike the hours. In this church there is (or at leaſt there *was* before the revolution) a ſilver ſhrine, enriched with pearls and diamonds, containing a ſort of wool called *manna*; which, it was pretended, fell from heaven in the time of a great drought, 1400 years ago! The abbey church of St Vedaſt is the greateſt ornament of Arras, being adorned with a fine ſteeple, and ſeats of admirable workmanſhip; the pulpit is of braſs, faſhioned like a tree, ſupported by two bears of the ſame metal, ſitting on their hind legs; there are little bears in different poſtures, ſeemingly ready to climb up the tree. The chimes are

remarkable for the different tunes they play. There are 10 pariſh churches. Arras is ſituated 22 miles SW. of Doway. Lon. 2. 50. E. Lat. 50. 20. N.

(2.) ARRAS, or ARAXES, a river of Perſia, in Georgia, which ariſes in Georgia, and running S. E. joins the Cyrus, and the united ſtreams fall into the Caſpian Sea between Shirvan and Aderbeitzan. See ARAXES.

(3.) * ARRAS. *n. ſ.* [from *Arras*, a town in Artois, where hangings are woven.] Tapeſtry; hangings woven with images.—

Thence to the hall, which was on every ſide
With rich array and coſtly *arras* dight.
Fairy Queen.

He's going to his mother's cloſet;
Behind the *arras* I'll convey myſelf,
To hear the proceſs. *Shakeſpeare.*

As he ſhall paſs the galleries, I'll place
A guard behind the *arras*. *Denham's Sophy.*

* ARRAUGHT. *v. a.* [a word uſed by *Spenſer* in the preter tenſe, of which I have not found the preſent, but ſuppoſe he derived *arreach* from *arracher*, Fr.] Seized by violence.—

His ambitious ſons unto them twain
Arraught the rule, and from their father drew.
Fairy Queen.

* ARRAY. *n. ſ.* [*arroy*, Fr. *arreo*, Sp. *arredo*, Ital. from *reye*, Teut. order. It was adopted into the middle Latin, *milites hominum arraitorum*, Knighton] 1. Order, chiefly of war.—The earl eſpying them ſcattered near the army, ſent one to command them to their *array*. *Hayward.*—

Wer't thou fought to deeds,
That might require the *array* of war, thy ſkill
Of conduct would be ſuch, that all the world
Could not ſuſtain thy proweſs. *Milton.*

A gen'ral ſets his army in *array*
In vain, unleſs he fight and win the day. *Denh.*

2. Dreſs.—

A rich throne, as bright as ſunny day,
On which there ſat moſt brave embelliſhed
With royal robes, and gorgeous *array*,
A maiden queen. *Fairy Queen.*

In this remembrance, Emily ere day
Aroſe and dreſs'd herſelf in rich *array*. *Dryd.*

3. In law, *Array*, of the Fr. *array*, i. e. *ordo*, the ranking or ſetting forth of a jury or inqueſt of men impannelled upon a cauſe. Thence is the verb *to array* a pannel, that is, to ſet forth one by another the men impannelled. *Cowel.*

* *To* ARRAY. *v. a.* [*arroyer*, old Fr.] 1. To put in order. 2. To deck; to dreſs; to adorn the perſon: with the particle *with* or *in*.—Deck thyſelf now with majeſty and excellency, and *array* thyſelf *with* glory and beauty. *Job*, xl. 10.—

Now went forth the morn,
Such as in higheſt heav'n *array'd in* glory
Empyreal. *Milton.*

3. In law. See ARRAY in law.

ARRAY, BATTLE. See ARRAY, and ARMY, § 2.

* ARRAYERS. *n. ſ.* [from *array*. Officers who anciently had the care of ſeeing the ſoldiers duly appointed in their armour. *Cowel.*

(1.) * ARREAR. *adv.* [*arriere*, Fr. behind.] Behind. This is the primitive ſignification of the word, which, though not now in uſe, ſeems to be retained by *Spenſer*. See REAR.—

To leave with ſpeed Atlanta ſwift *arrear*,
Through foreſts wild and unfrequented land,
To chaſe the lion, boar, or rugged bear.
Fairy Queen.

(2.) * ARREAR. *n. ſ.* That which remains behind unpaid though due. See ARREARAGE.—

His boon is giv'n; his knight has gain'd the day,
But loſt the prize; th' *arrears* are yet to pay.
Dryden.

—If a tenant run away in *arrear* of ſome rent, the land remains; that cannot be carried away, or loſt. *Locke.* It will comfort our grand children, when they ſee a few rags hung up in Weſtminſter-hall, which coſt an hundred millions, whereof they are paying the *arrears*, and boaſting, as bold as do, that their grandfathers were rich. *Swift.*

* ARREARAGE *n. ſ.* a word now little uſed [from *arriere*, Fr. behind.] *Arrearage* is the remainder of an account, or a ſum of money remaining in the hands of an accountant; or, more generally, any money unpaid at the due time. *Arrearage* of rent. *Cowel.*—Paget ſet forth the king of England's title to his debts and penſions from the French king; with all *arrearages*. *Howard.*—The old *arrearages* under which the crown had long groaned, being deſtroyed, he had brought Lurana to uphold and maintain her. *Howel's Vocal Foreſt.*

* ARREARANCE. *n. ſ.* The ſame with *arrear*. See ARREAR. *Dict.*

ARREARS. See ARREAR and ARREARAGE.

ARRECTARIA. *n. ſ.* in architecture, ſtone or timber ſet upright, to ſupport the weight of a building.

ARRECTATUS, in law, accuſed of a crime.

To ARREED. *v. a.* to award. *Milton.*

ARRENATUS, in law, arraigned.

* ARRENTATION, *n. ſ.* [from *arrenter*, Span. to farm.] Is, in the foreſts law, the leaſing an owner of lands in the foreſt, to incloſe them with a low hedge and a ſmall ditch, in conſideration of a yearly rent. *Dict.*

* ARREPTITIOUS. *adj.* [*arreptus*, Lat.] Snatched away. 2. [from *ad* and *repo*.] Creeping in privily.

ARRERAGIUM, arrears. See ARREAR, No (1. 1.)

* ARREST. *n. ſ.* [from *arreſter*, Fr. to ſtop.] 1. In law. A ſtop or ſtay; as, a man is apprehended for debt, is ſaid to be arreſted. To plead in arreſt of judgment is to ſhew cauſe why judgment ſhould be ſtayed, though the verdict of the twelve be paſſed. To plead in *arreſt* of the inqueſt upon the former iſſue, is to ſhew cauſe why an inqueſt ſhould not be taken. An *arreſt* is a certain reſtraint upon a man's perſon, depriving him of his own will, and binding it to become obedient to the will of the law, and may be called the beginning of impriſonment. *Cowel.*—If I could ſpeak ſo wiſely upon an *arreſt*, I would ſend for my creditors; yet I had as lief have the foppery of freedom, as the mortality of impriſonment. *Shakeſpeare.* 2. Any caption, ſeizure of the perſon.—To the rich man who procured himſelf eaſe for many years, it was a [illegible] his ſoul was ſurpriſed the firſt night. [illegible] A ſtop.—The ſtop and *arreſt* of the [illegible] that the air hath little appetite of [illegible]

(1.) ARREST, in Engliſh law, is either uſed in civil or criminal caſes.

1. *An* ARREST, IN A CIVIL CAUSE, is defined to be the apprehending or reſtraining one's perſon by proceſs in execution of the command of ſome court. An arreſt muſt be by corporal ſeiſing or touching the defender's body; after which the bailiff may juſtify breaking open the houſe in which he is, to take him; otherwiſe he has no ſuch power; but muſt watch his opportunity to arreſt him. For every man's houſe is looked upon by the law to be his caſtle of defence and aſylum, wherein he ſhould ſuffer no violence. Which principle is carried ſo far in the civil law, that for moſt part, not ſo much as a common citation or ſummons, much leſs an arreſt, can be executed upon a man within his own walls. Peers of the realm, members of parliament, and corporations, are privileged from arreſts; and of courſe from outlawries. And againſt them the proceſs to inforce an appearance muſt be by ſummons and diſtreſs *infinite*, inſtead of a *capias*. Alſo clerks, attorneys, and all other perſons attending the courts of juſtice (for attorneys being officers of the court, are always ſuppoſed to be there attending,) are not liable to be arreſted by the ordinary proceſs of the court, but muſt be ſued by bill called uſually a *bill of privilege*) as being perſonally preſent in court. Clergymen performing divine ſervice, and not merely ſtaying in the church with a fradulent deſign, are for the time privileged from arreſts, by ſtatute 50 Edw. III. c. 5. and 1 Rich. II. c. 16.; alſo likewiſe members of convocation actually attending thereon, by ſtatute 8 Hen. VI. c. 1. Suitors, witneſſes, and other perſons, neceſſarily attending any courts of record upon buſineſs, are not to be arreſted during their actual attendance, which includes the neceſſary coming and returning. Seamen in the king's ſervice are privileged from arreſts for debts under L. 20. (2 Geo. II. c. 24. and 4 Geo. II. c. 38.) and ſoldiers or marines are not liable to arreſts for a debt of leſs than L. 10. (30 Geo. II. c. 6. 11.) And no arreſt can be made in the king's preſence, nor within the verge of his royal palace, nor in any place where the king's juſtices are actually ſitting. The king hath moreover a ſpecial prerogative (which indeed is very ſeldom exerted,) that he may by his *writ of protection* privilege a defendant from all perſonal, and many real ſuits, for one year at a time, and no longer; in reſpect of his being engaged in his ſervice out of the realm. And the king alſo by the common law might take his credit into his protection, ſo that no one might ſue or arreſt him till the king's debt, was paid; but by the ſtatute 23 Hen. III. c. 19. notwithſtanding ſuch protection, any other creditor may proceed to judgment againſt him, with a ſtay of execution, till the king's debt is paid; unleſs ſuch creditor will undertake for the king's debt and then he ſhall have execution for both. And, laſtly, by ſtatute 29 Car. II. c. 7. no arreſt can be made, nor proceſs ſerved, upon the Sunday, except for treaſon, felony, or breach of the peace.

2. *An* ARREST, IN A CRIMINAL CAUSE, is the apprehending or reſtraining one's perſon, in order to be forthcoming to anſwer an alledged crime. To this arreſt all perſons whatſoever are, without diſtinction, equally liable; and doors may be broken open to arreſt the offender; but no man is to be arreſted, unleſs charged with ſuch a crime as will at leaſt juſtify holding him to bail when taken. There is this difference alſo between arreſts in civil and criminal caſes, that none ſhall be arreſted for debt, treſpaſs, or other cauſe of action, but by virtue of a precept or commandment out of ſome court; but for treaſon, felony, or breach of the peace, any man may arreſt with or without warrant or precept. But the king cannot command any one by word of mouth to be arreſted; for he muſt do it by writ, or order of his courts, according to law: nor may the king arreſt any man for ſuſpicion of treaſon, or felony, as his ſubjects may; becauſe, if he doth wrong, the party cannot have an action againſt him. Arreſts by private perſons are in ſome caſes commanded. Perſons preſent at the committing of a felony muſt uſe their endeavours to apprehend the offender, under penalty of fine and impriſonment; and they are alſo, with the utmoſt diligence, to purſue and endeavour to take all thoſe who ſhall be guilty thereof out of their view, upon a hue and cry levied againſt them. By the vagrant act 17 Geo. II. c. 5. every perſon may apprehend beggars and vagrants; and every private perſon is bound to aſſiſt an officer requiring him to apprehend a felon. In ſome caſes likewiſe arreſts by private perſons are rewarded by law. By the 4th and 5th William and Mary, c. 8. perſons apprehending highwaymen, and proſecuting them to a conviction, are intitled to a reward of L. 40, and if they are killed in the attempt, their executors, &c. are intitled to the like reward. By the 6 and 7 William III. c. 17. perſons apprehending counterfeiters and clippers of the coin, and proſecuting them to conviction, are intitled to L. 30. By 5 Ann, c. 31. perſons who ſhall take one guilty of burglary, or the felonious breaking and entering any houſe in the day time, and proſecute them to conviction, ſhall receive the ſum of L. 40 within one month after ſuch conviction. Arreſts, by public officers, as watchman, conſtables, &c. are either made by their own authority, which differs but very little from the power of a private perſon; or they are made by a warrant from a juſtice of peace. See WARRANT.

(3.) ARREST OF JUDGMENT, in law, the aſſigning juſt reaſon why judgment ſhould not paſs: as, Want of notice of the trial; a material defect in the pleading; when the record differs from the deed impleaded; when perſons are miſnamed; where more is given by the verdict than is laid in the declaration, &c. This may be done either in criminal or civil cauſes.

(II.) * ARREST. *n. ſ.* [in horſemanſhip.] A mangey humour between the ham and paſtern of the hinder legs of a horſe. *Dict.*

* *To* ARREST. *v. a.* [*arreſter*, Fr. to ſtop.] 1. To ſeize by a mandate from a court or officer of juſtice. See ARREST.—There's one yonder *arreſted*, and carried to priſon, was worth five thouſand of you all. *Shakeſp.* 2. To ſeize any thing by law.—He hath enjoyed nothing of Ford's but twenty pounds of money, which muſt be paid to Mr Brook; his horſes are *arreſted* for it. 3. To ſeize; to lay hands on; to detain by power.—

But

But when as Morpheus had with leaden maze
Arreſted all that goodly company. *Fairy Queen.*

4. To with-hold; To hinder.—This defect of the Engliſh juſtice was the main impediment that did *arreſt* and ſtop the courſe of the conqueſt. *Davies.*—

As often as my dogs with better ſpeed
Arreſt her flight is ſhe to death decreed. *Dryd.*

Nor could her virtues, nor repeated vows
Of thouſand lovers, the relent leſs hnd
Of death *arreſt*. *Philips.*

5. To ſtop mention.—To manifeſt the coagulative power, we have *arreſted* the fluidity of new milk, and turned it into a curdled ſubſtance. *Boyle.* 6. To obſtruct; to ſtop.—Aſcribing the cauſes of things to ſecret proprieties, hath *arreſted* and laid aſleep all true enquiry. *Bacon.*

ARRESTANDIS BONIS *ne diſſipentur*, a writ which lies for him whoſe cattle or goods are taken by another, who during the controverſy is likely to make away with them, and will hardly be able to give ſatisfaction for them afterwards.

ARRESTANDO, IPSUM, *qui pecuniam recepit ad proficiſcendum in obſequium regis*, &c. is a writ which lies for the apprehenſion of him that hath taken bounty money to ſerve in the king's wars, and hides himſelf when he ſhould go.

ARRESTMENT, in Scots law, ſignifies the ſecuring of a criminal till trial, or till he find caution to ſtand, in what are called *bailable crimes*. In civil caſes, it ſignifies either the detaining of ſtrangers or natives *in meditatione fugæ*, till they find caution *judicie ſiſti*, or the attaching the effects of a ſtranger in order to found juriſdiction. But in the moſt general acceptation of the word, it denotes that diligence by which a creditor detains the goods or effects of his debtor in the hands of third parties till the debt due to him be either paid or ſecured. See LAW, INDEX.

ARRESTO FACTO SUPER BONIS, &c. a writ brought by a denizen againſt the goods of aliens found within this kingdom, as a recompence for goods taken from him in a foreign country.

ARRET, a decree: the deciſion of a ſovereign court. *Bailey.*

* ARRETED. *adj.* [*arrectatus*, low Lat.] He that is convened before a judge, and charged with a crime.—It is uſed ſometimes for *imputed* or *laid unto*; as, no folly may be *arreted* to one under age. *Cowel.*

ARRETIUM, or ARRHETIUM, one of the 12 ancient towns of Tuſcany, near the Arnis and Clanis, ſituated in a pleaſant valley; now called Arezzo, 42 miles eaſt of Florence. See AREZZO.

(1.) ARRETS. in horſemanſhip. See ARREST, N° II.

(2.) ARRETS, or ARRETES, [*Aretes*, Fr.] in ichthyology, the back bones of fiſhes.

ARRHABONARII, [from ἀρραβὼν, earneſt,] a ſect, of Chriſtians, who held that the euchariſt is neither the real fleſh or blood of Chriſt, nor yet the ſign of them; but only the pledge or earneſt thereof.

ARRHÆ, or ARGENTUM DEI. See ARGENTUM DEI, and EARNEST, &c.

ARRHAPHON, a ſkull without ſutures, found to be the cauſe of incurable cephalalgiæ.

ARRHENOGOGON, in botany, a name given by ſome to the *parietaria*, or pellitory of the wall.

ARRHEPHORIA, a feaſt among the anciefit Athenians, inſtituted in honour of Minerva, and Herſe daughter of Cecrops. The word was compoſed of ἄρρητον, myſtery, and φέρω, I carry; on account of certain myſterious things which were carried in proceſſion at this ſolemnity.—Boys, or, as ſome ſay, girls, between 7 and 12 years of age, were the miniſters that aſſiſted at this feaſt, and were denominated ἀρρηφόροι. This feaſt was alſo called *Herſiphoria*, from Herſe already mentioned.

ARRHETINI, the inhabitants of Arretium.

ARRHETIUM. See ARRETIUM.

ARRIA, the virtuous and heroic wife of Pætus, who being condemned to death unjuſtly, along with her huſband, by the tyrant Nero, firſt ſtabbed herſelf, and then gave the dagger to her huſband, ſaying, "Pætus, it is not painful."

ARRIAGA, Roderic d', a learned Spaniſh Jeſuit, born in 1592. He became profeſſor in theology and philoſophy at Prague, where he died in 1667. He wrote a courſe of Philoſophy, and of Theology. The former was printed at Antwerp in 1632, and the latter in 1683; 8 vols folio.

ARRIAGI, in the materia medica, a name given by ſome authors, particularly by Serapion and Avicenna, to a fine kind of camphor.

ARRIAN, a famous Grecian philoſopher and hiſtorian of the 2d century. He was born at Nicomedia in Bithynia, and flouriſhed under Adrian and the two Antonines. He united in himſelf the character of a warrior and a philoſopher. His great learning and eloquence procured him the title of *The ſecond Xenophon*; and raiſed him to the conſulſhip and moſt conſiderable dignities at Rome. His 4 books of *Diſſertations upon Epictetus*, whoſe ſcholar he had been: and his *Hiſtory of Alexander the Great*, in 7 books, are admired by the beſt judges; he wrote ſeveral other tracts. An Engliſh tranſlation of his hiſtory of Alexander was publiſhed by Rooke, in 2 vols 8vo, 1729.

* *To* ARRIDE. *v. a.* [*arideo*, Lat.] 1. To laugh at. 2. To ſmile; to look pleaſantly upon one.

(1.) ARRIEGE, a department of France, bounded on the W. and N. by that of upper Garonne, on the E. by Aude, and on the S. by the Pyrenees. It is ſo named from the river. See N° 2.

(2.) ARRIEGE, a river of France, which riſes among the Pyrenees, runs through the department (N° 1), and paſſing by Foix and Pamiers, falls into the Garonne, near Toulouſe. Gold duſt has been found amongſt its ſands.

(1.) * ARRIERE. *n. ſ.* [French.] The laſt body of an army, for which we now uſe *rear*.—The horſemen might iſſue forth without diſturbance of the foot, and the avant-guard without ſtuffing with the battail or *arriere*.

(2.) * ARRIERE BAN *n. ſ.* [*Caſſeneuve* derives this word from *arriere* and *ban*; *ban* denotes the convening of the nobleſſe or vaſſals, who hold fees immediately of the crown: and *arriere*, thoſe who only hold of the king immediately.] A general proclamation, by which the king of France ſummons to the war all that hold of him, both his own vaſſals or the nobleſſe, and the vaſſals of his vaſſals.

(3.) * ARRIERE, FEE, or FIEF, is a fee dependant on a ſuperior one. Theſe fees commenced when dukes and counts, rendering their govern-

ment

ments hereditary, diſtributed to their officers parts of the domains, and permitted thoſe officers to gratify the ſoldiers under them in the ſame manner.

(4.) ARRIERE GUARD. See REAR-GUARD.

(5.) * ARRIERE VASSAL. The vaſſal of a vaſſal. *Trevoux.*

ARRINGTON, a village 9 miles from Cambridge, ſeated on the Cam, over which it has a bridge, towards Wetidy.

* ARRISON. *n. ſ.* [*arriſio*, Lat.] A ſmilling upon. *Dict.*

* ARRIVAL. *n. ſ.* [from *arrive.*] The act of coming to any place; and, figuratively, the attainment of any purpoſe.—

How are we changed, ſince we firſt ſaw the queen?
She, like the Sun, does ſtill the ſame appear,
Bright as ſhe was at her *arrival* here. *Waller.*

* ARRIVANCE. *n. ſ.* [from *arrive.*] Company coming: not in uſe.—

Every minute is expectancy
Of more *arrivance.* *Shakeſpeare.*

* *To* ARRIVE. *v. n* [*arriver*, Fr. To come on ſhore.] 1. To come to any place by water.—

At length *arriving* on the banks of Nile,
Wearied with length of ways, and worn with toil,
She laid her down. *Dryden.*

2. To reach any place by travelling.—When we were *arrived* upon the verge of his eſtate, we ſtopped at a little inn, to reſt ourſelves and our horſes. *Sidney.* 3. To reach any point.—The bounds of all body we have no difficulty to *arrive* at; but when the mind is there, it finds nothing to hinder its progreſs. *Locke.* 4. To gain any thing, by progreſſive approach.—It is the higheſt wiſdom by deſpiſing the world to *arrive* at heaven; they are bleſſed who converſe with god. *Taylor.* 5. The thing at which we *arrive* is always ſuppoſed to be good. 6. To happen: with *to* before the perſon. This ſeems not proper.—

Happy! *to* whom this glorious death *arrives.*
More to be valued then a thouſand lives.
Waller.

ARRO, a river in Herefordſhire, which runs into the Lug, near Leominſter.

ARROBAS, or ARROBE. See AROBAS.

* *To* ARRODE. *v. a.* [*arrodo*, Lat.] To gnaw or nibble. *Dict.*

ARROE, a ſmall iſland of Denmark, in the Baltic Sea, a little S. of the iſland of Funen, and N. of that of Dulcen. It is 8 miles in length, and about 2 in breadth; and produces corn, anniſeed, black cattle and horſes. It has 3 pariſhes, the moſt conſiderable of which is Koping. It ſtands at the S. ſide of the iſland, in the bottom of a bay, and has a port with ſome trade. Lon. 10. 20. E. Lat. 55. 10. N.

* ARROGANCE. } *n. ſ.* [*arrogantia*, Lat.]
* ARROGANCY. } The act or quality of taking much upon one's ſelf: that ſpecies of pride which conſiſts in exorbitant claims.—

Stanly, notwithſtanding ſhe's your wife,
And loves not me; be you good lord, aſſur'd,
I hate not you for her proud *arrogance.* *Shakeſ.*
Pride hath no other glaſs
To ſhew itſelf but pride; for ſupple knees
Feed *arrogance*, and are the proud man's fees.
Shakeſp.

—Pride and *arrogance*, and the evil way, and the froward mouth do I hate. *Prov.* viii. 13.—Diſcourſing of matters dubious, and on any controvertible truths, we cannot, without *arrogancy*, entreat a credulity. *Brown's Vulgar Errours.*—Humility it expreſſes by the ſtooping and bending of the head; *arrogance*, when it is lifted, or as we ſay, toſſed up. *Dryden's Dufreſny.*

* ARROGANT. [*adj. arrogans*, Lat.] Given to make exhorbitant claims; haughty; proud.—Feagh's right unto that country which he claims or the ſigniory therein, muſt be vain and *arrogant.* *Spenſer on Ireland.*—An *arrogant* way of treating with other princes and ſtates, is natural to popular governments. *Temple.*

* ARROGANTLY. *adv.* [from *arrogant.*] In an arrogant manner.—

Our poet may
Himſelf admire the fortune of his play;
And *arrogantly*, as his fellows do,
Think he writes well, becauſe he pleaſes you.
Dryden.

* ARROGANTNESS. *n. ſ.* [from *arrogant.*] The ſame with *arrogance*; which ſee. *Dict.*

* *To* ARROGATE. *v. a.* [*arrogo*, Lat.] To claim vainly; to exhibit unjuſt claims only prompted by pride.—I intend to deſcribe this battle fully, not to derogate from one nation, or to *arrogate* to the other. *Hayward.*

(1.) * ARROGATION. *n. ſ.* [from *arrogate.*] A claiming in a proud unjuſt manner. *Dict.*

(2.) ARROGATION. See ADROGATION.

ARROJO DE ST SERVAN, a town of Spain, in Eſtremadura, 8 miles S. of Merida, and 25 E. of Badjox. Lon. 6. 20. W. Lat. 38. 36. N.

ARRON, a river of France, in the department of Nievre.

ARRONDEE, in heraldry, a croſs, the arms of which are compoſed of ſections of a cricle, not oppoſite to each other, ſo as to make the arms bulge out thicker in one part than another; but the ſections of each arm lying the ſame way, ſo that the arm is every where of an equal thickneſs, and all of them terminating at the edge of the eſcutcheon like the plain croſs.

ARROQUHAR, a pariſh of Scotland, in Dumbartonſhire, 14 miles long and about 4 broad. In the Gaelic it is pronounced *Arrar*, and wrote *Ardtbir*, i. e. a high country: which is deſcriptive of the place, as it is almoſt wholly mountainous; notwithſtanding which the climate is temperate. By Mr Gilleſpie's report to Sir John Sinclair, it contained in 1791, 379 inhabitants, which was 87 fewer, than the number in 1755. Of theſe the greater part are of one name, viz. *Macfarlane.* There were 60 horſes, 460 black cattle, and 10,600 ſheep in the pariſh, in 1791.

* ARROSION. *n. ſ.* [from *arroſus*, Lat.] A gnawing. *Dict.*

ARROU, a river of France, in the department of Nievre.

ARROUX, a river of France in the department of Cote d'Or. Perhaps it is the ſame with ARROU, for the two departments are contiguous, and moſt of

of our geographers are amazingly inaccurate in their orthography, as well as in their deſcriptions and delineations of rivers in general.

(I. 1.) * ARROW. *n. ſ.* [*arere*, Sax.] The pointed weapon which is ſhot from a bow. Darts are thrown by the hand, but in poetry they are confounded.—

I ſwear to thee by Cupid's ſtrongeſt bow,
By his beſt *arrow* with the golden head. *Shak.*

—Here were boys ſo deſperately reſolved, as to pull *arrows* out of their fleſh, and deliver them to be ſhot again by the archers on their ſide. *Hayward.*

(2.) ARROW. See ARCHERS, § 1, 4, & ARCHERY, § 2, 3.

(II.) ARROW, in aſtronomy, trigometry, &c. See SAGITTA.

(III.) ARROW, in fortification, is a work placed at the ſaliant angles of the glacis, and conſiſts of two paparets, each forty toiſes long. This work has a communication with the covert way, of a bout 24 or 30 feet broad, called *caponier*; and a ditch before it, of 5 or 6 toiſes.

(IV. 1.) ARROW, in geography, a river in Worceſterſhire and Warwickſhire.

(2. 3.) ARROW, two villages, 1. in Cheſhire, between the river Dee and Lancaſter: and 2. in Warwickſhire, near Aulceſter.

(V.) ARROW, in ſurveying, is uſed for ſmall ſtrait ſticks about two feet long, ſhod with iron ferrils. Their uſe is to ſtick into the ground at the end of the chain.

ARROW, ELF. See ELF-ARROWS.

(1.) * ARROW-HEAD. *n. ſ.* [from *arrow* and *head*.] A water plant, ſo called from the reſemblance of its leaves to the head of an arrow. *Dict.*

(2.) ARROW-HEAD, in botany. See SAGITTARIA.

(3.) ARROW-HEADED GRASS. See TRIGLOCHIN.

(4.) ARROW-HEADS, or ARROW STONES, in antiquity, pieces of barbed flint, thin and ſharp at the points, with which our anceſtors armed their arrows. Specimens of them are often found in various places of Scotland, and preſerved by antiquarians. The inhabitants of ſome of the South Sea iſlands head their arrows with ſtone, others with bones; metal being unknown among them.

ARROW MAGICAL, a ſort of weapon very common among the barbarous inhabitants of Lapland, and many of the northern climates; and ſuppoſed to poſſeſs very ſtrange virtues.

ARROW-MAKERS are alſo called *fletchers*; and were formerly, as well as bowyers, perſons of great conſequence in the kingdom. Arrow heads and quarrels were to be well boched or braſed, and hardened at the points with ſteel: the doing of which ſeems to have been the buſineſs of the arrow-ſmith.

ARROW ROOT. See MARANTA.

ARROWSMITH, John, a non-conformiſt divine, who, in 1660, was theological profeſſor at Cambridge. He is chiefly celebrated for his writings, viz. *Tracta Sacra*; *Godman*, or an Expoſition of the 1ſt chapter of St John's Goſpel; and a Chain of Principles, or a Courſe of Theology; all highly Calviniſtic, and printed in 4to. He died a bout the time of the reſtoration.

ARROW STONES. See ARROW-HEADS, § 4.

ARROW, WILDFIRE. See WILDFIRE.

* ARROWY. *adj.* [from *arrow*.] Conſiſting of arrows.—

He ſaw them in their forms of battle rang'd,
How quick they wheel'd, and flying, behind them ſhot
Sharp fleet of *arrowy* ſhow'r againſt the face
Of their purſuers, and o'ercame by flight.
Milton.

ARS, [Lat. from ἀρετὴ, utility, Gr.] Art. The word is often conjoined with adjectives expreſſing particular, real, or pretended arts; ſuch as,

1. ARS NOTORIA, a pretended manner of acquiring ſciences by infuſion, without any application, except faſting, and performing certain ceremonies! This art was condemned by the Sorbonne, A. D. 1320.

2. ARS THESSALICA, the Theſſalian art, is uſed by ancient writers, for a ſpecies of magic, whereby it was pretended, they could draw the moon and ſtars out of heaven! It was denominated Theſſalian from its ſuppoſed inventors, the people of Theſſaly.

ARACES I. king of Parthia, was the firſt of the Parthian monarchs. Having been provoked at the bad uſage of a younger brother, about A. A. C. 250, he perſuaded his countrymen to ſhake of the Macedonian yoke; on which they chose him as their ſovereign. He reigned 38 years, during which he added to his dominions; but was killed in a battle againſt Ariarathes IV. king of Cappadocia.

ARACES II. ſon of the preceding, ſucceeded his father on the throne of Parthia. He maintained a powerful oppoſition to Antiochus the Great; and it ſeems probable this is the king of Parthia ſpoken of in the 1ſt book of Maccabees, xiv. 2, who conſiderably enlarged the kingdom of Parthia, by his good conduct and valour. See PARTHIA. He was ſucceeded by his ſon Arſaces Priapatius.

ARSACES TIRANUS, king of Armenia, was treacherouſly made captive by Sapor, king of Perſia, who ordered him to be bound with ſilver chains! after which he was confined in a priſon at Ecbatana, in which he died, A. A. C. 163; and Armenia then became a province of Perſia.

ARSACIDÆ, the royal family of Parthia, ſo named from Arſaces the founder.

ARSAMAS, a town of Ruſſia, in the territory of Morduates, ſeated on the river Mockcha-reca on the road to Aſtracan, 500 miles S. by E. from Moſcow, and 500 N. by W. from Aſtracan. In this place Gen. Dolgorucki puniſhed the rebellious Coſſacks.

ARSCHIN, a long meaſure uſed in China, the meaſure ſtuffs: of the ſame length with the Dutch ell, which is 2 feet 11 lines. Four archins make 3 yards Engliſh.

ARSCHOT, a town of the Auſtrian Netherlands, ſeated on the Demer, 14 miles E. of Mechlin. Lon. 4. 45. E. Lat. 51. 5. N.

* ARSE. *n. ſ.* [*earge*, Sax.] The buttocks or hind part of an animal.

* ARSE FOOT. *n. ſ.* A kind of water fowl, called alſo a *didapper*. *Dict.*

ARSE-HILL-TOUN, an ancient name of Earlstoun, a village in Berwickſhire, ſo called from its low ſituation. See EARLSTOUN, N° 2.

ARSELL,

ARSELLA, in botany, a name given by ſome of the Greek writers, to the *argemone*, a kind of wild poppy; and by others to the common agrimony.

(1.) * ARSENAL. *n. ſ.* [*arſenale*, Ital.] A repoſitory of things requiſite to war; a magazine of military ſtores.—I would have room for the old Roman inſtruments of war, where you might ſee all the ancient military furniture, as it might have been in an *arſenal* of old Rome. *Addiſon.*

(2.) ARSENAL, ETYMOLOGY OF. Some derive this word from *arx*, a fortreſs; others from *ars*, denoting a machine; others again from *arx* and *ſenatus*, becauſe this was the defence of the ſenate; but the moſt probable derivation is from the Arabic *darſenaa*, which ſignifies arſenal.

(3.) ARSENALS, FOREIGN. The arſenal of Venice is the place where the galleys are built and laid up. The arſenal of Paris is that where the cannon or great guns are caſt. It has this inſcription over the gate:

Ætna hæc Henrico vulcania tela miniſtrat,
Tela Gigantæos debellatura furores.

There are arſenals appropriated to naval furniture and equipments. At Marſeilles is the arſenal for the galleys; and at Toulon, Rochefort, and Breſt, are thoſe for the men of war.

(1.) ARSENIC, a heavy opake ſubſtance, uſually ſold in white maſſes, which, when broken, diſcover a ſemi-tranſparency ſomewhat reſembling that of ſal ammoniac, but by expoſure to the air become white and opake like the outſide of the original maſs. By various chemical proceſſes it may be made to aſſume the appearance either of an acid ſalt or metal, at the pleaſure of the operator; and therefore has been conſidered both as a ſaline ſubſtance and a ſemi-metal. See Dr Johnſon's account of it, § 7.

(2.) ARSENIC, ANCIENT ACCOUNTS OF. It is not known at what time this mineral was diſcovered; though, as it abounds among many different kinds of ores, it is probable that the pernicious properties it manifeſts would very ſoon make it be taken notice of by metallurgiſts. Ariſtotle makes mention of a ſubſtance called Σανδαραχη; and his diſciple Theophraſtus makes mention of one name Αρσενικον, which by Dioſcorides and others was called Αρρενικον, about the beginning of the Chriſtian æra. By this, however, it appears, that they only meant the ſubſtances now called *ſandarach* and *orpiment*; and Avicenna, who lived in the 11th century, is the firſt who expreſsly mentions white arſenic, as well as its ſublimate. It is not known by whom arſenic was firſt reduced to a metallic form. Paracelſus aſſerts that arſenic, ſublimed with egg-ſhell lime becomes like ſilver; and in 1675, M. Limeri makes mention of a method of ſubliming arſenic with fixed alkali and ſoap.

(3.) ARSENIC, DIFFERENT OPINIONS RESPECTING. The true nature of arſenic being little known, it is no wonder to find chemiſts differing very much as to the claſs of natural bodies in which it ought to be placed. Avicenna and a great number of others claſs it with the ſulphurs; Albertus Magnus and his followers, among the alts. Becher conſiders it as a kind of ſoap, or ſaline ſulphureous body. Later experiments, however, have made it evident, that white arſenic conſiſts of an acid united to phlogiſton; and that by diminiſhing the latter, the acid becomes more and more apparent; while, on the contrary, by augmenting the quantity of phlogiſtic matter, the arſenic aſſumes the metallic form. With reſpect to the ſulphureous nature of arſenic, it appears indeed that the regulus itſelf, as well as orpiment and realgar, are inflammable ſubſtances; but it is not ſo with white arſenic. This inflammability, therefore, which arſenic in a certain ſtate has in common with zinc and ſeveral other ſubſtances, will not denominate it ſulphureous, any more than thoſe of other bodies, which poſſeſs the common property of inflammability can be denominated *ſulphurs*.

(4.) ARSENIC, DISQUISITION RESPECTING THE POWERS OF. It is commonly ſaid that arſenic mineralizes metals; and therefore, ſays Mr Bergman, it is conſidered as a ſulphur by ſome, who yet extend the idea of mineralization ſo far, as under it to comprehend all mixtures of which metals make a part. But if we examine this ſignification a little more accurately, we ſhall ſee it is extended too far; for if this be admitted, we muſt at the ſame time allow, that no native metal is to be found. Thus the gold called *native*, is ſeldom if ever found pure, but more or leſs mixed with copper or ſilver; and ſo with other metals. If, therefore, arſenic, which, unleſs in its reguline ſtate, never diſſolves other metals, be conſidered as a mineralizing ſubſtance, what hinders us from ſaying that gold is mineralized by ſilver or copper, and in general every metal mineralized by ſome other? It is much more natural to ſuppoſe that thoſe metals are mineralized which are actually diſſolved and concealed by a menſtruum. Sulphur is the chief agent employed by nature for this purpoſe; and though the acids of vitriol, phoſphorus, nitre, and ſometimes even the aerial acid, occaſion the metals to put on an appearance foreign to their nature, yet the number of theſe is ſo ſmall, that, compared with the ſulphurated minerals, they almoſt vaniſh. This mineral, ſo troubleſome to the mineralogiſt, occaſioned the alchemiſts to ſuſpect the exiſtence of a certain arſenical principle indiſpenſable to the perfection of every metal. Even ſo late as 1773, a queſtion to this purpoſe was propoſed by the Royal Academy of Sciences at Berlin: the prize was adjudged to M. Monnet, who in his anſwer conſidered arſenic as a ſemi-metal of a peculiar kind, which is ſo far from conſtituting any eſſential part of metals, that its preſence is always attended with inconveniences, either by carrying off the metal as it flies away, or ſpoiling the maſs in which it remains. Theſe conſiderations, however, do not hinder us from aſſerting that the acid of arſenic, like others, is a mineralizing ſubſtance, if at any time it happens to meet with metals in the bowels of the earth, and to unite with it in that form. Arſenic in its pure ſtate is well known to be a moſt deſtructive and deadly poiſon, for which the art of medicine has ſcarcely as yet afforded a cure. Mr Bereman is of opinion that it acts as an highly corroſive acid, even when applied externally. He alſo tells us, that the dry acid is more deſtructive than white arſenic; the regulus and realgar leſs ſo.

ſo. From an experiment of Mr Scheele, however, in which 8 grains of arſenical acid were given to a cat, it does not appear that it acts more violently than white arſenic. The extreme danger attending this ſubſtance when taken into the human body, ariſes from its inſolubility, and the difficulty of decompounding it; for there can but little danger ariſe from a liquid, unleſs, like corroſive acids, it ſhould at once burn the ſubſtance of the ſtomach like fire; or like laurel water ſuſpend the action of the nervous ſyſtem. Corroſive ſublimate, ſolutions of mercury in aquafortis, &c. will as certainly poiſon as arſenic; but they are much leſs difficult to cure, becauſe any alkaline ſubſtance will certainly decompound them and deſtroy their deleterious efficacy. Arſenic, on the contrary, cannot be decompounded, nor united with any known ſubſtance, at leaſt in ſuch a ſhort time as the exigence of the caſe we ſpeak of would require, without a conſiderable degree of heat. It therefore remains in the ſtomach, continually exerting its miſchievous qualities, unleſs it can be diſcharged by vomiting.

(5.) ARSENIC, EFFECTS OF, WHEN SWALLOWED. The ſymptoms attending arſenic when ſwallowed are, naufea, ſickneſs, and retching to vomit, about half an hour after it is taken. Theſe are followed by violent, vomitings, hiccups, and pains in the ſtomach and bowels. Convulſions and palſies of the limbs preſently ſucceed, with intenſe heats, cold ſweats, palpitations of the heart, extreme anxiety, proſtration of ſtrength, thirſt and dryneſs of the mouth and throat, loſs of reaſon, and at laſt death. If the quantity taken was conſiderable, the patient dies in 7 or 8 hours after taking it; and the ſtomach and inteſtines are found, upon diſſection, to be corroded and perforated. When this is not the caſe, violent putrefactive ſymptoms ſoon enſue after arſenic is ſwallowed; for the bodies of thoſe who are poiſoned by it generally have abundance of red or purple ſpots even before death. It remarkably inflames the coats of the ſtomach, and the putrefaction is ſaid particularly to take place in the genitals of men. Mr Bergman relates, that in the body of a man who was poiſoned with arſenic, and diſſected in the anatomical theatre at Upſal, the putrefaction had been ſo ſtrong, that the mineral was deprived of part of its phlogiſton, and emitted the garlic ſmell, that peculiar characteriſtic of arſenic when in this ſituation.

(6.) ARSENIC, INEFFICACY OF ANTIDOTES AGAINST. Many antidotes have been propoſed againſt this dreadful poiſon by authors of the higheſt reputation; but it is to be feared without that ſucceſs which the confidence of thoſe who propoſed them ſeemed to enſure. Indeed, previous to any great hope of ſucceſs in this reſpect, it ought to be ſhown that theſe antidotes are able to effect ſome conſiderable change on arſenic when out of the body; and that not in ſolution, but when in a powder not very fine, as is the caſe with arſenic when it is uſually taken. Mr Bergman recommends alkalies in diſeaſes occaſioned by arſenic: Nay he tells us, that "ſince phlogiſton and alkalies are the moſt powerful correctors of acid acrimony, it will *readily occur*, how it may be mitigated, and its deleterious effects obviated." But the many fatal accidents conſequent on taking this mineral, ſhow that none of thoſe are to be depended upon.—Bergman himſelf indeed cautions us againſt truſting to phlogiſton correctors alone; and perhaps the ſolution of hepar ſulphuris, which contains the united powers of both the alkaline and phlogiſtic antidotes united, might prove more efficacious than either of them ſingly. Oils, fats, milk, warm fat broths, freſh butter, &c have all been recommended; and, no doubt, in ſuch deplorable caſes, are thoſe remedies to which we can moſt readily have recourſe: but, even here, it is evident, that their efficacy muſt be exceedingly dubious, whatever their intrinſic virtues may be; and for this plain reaſon, that the arſenic is already in contact with the ſtomach, and though the remedies might have prevented its action, had they been *firſt* ſwallowed, their operation muſt be much leſs powerful after the poiſon has had access to the ſtomach, and begun to exert its pernicious effects.

(7.) * ARSENICK. *n. ſ.* [*arſenicum.*] A ponderous mineral ſubſtance, volatile and uninflammable, which gives a whiteneſs to metals in fuſion, and proves a violent corroſive poiſon; of which there are three ſorts. *Native* or *yellow arſenick*, called alſo auripigmentum or orpiment, is chiefly found in copper mines. *White* or *cryſtalline arſenick* is extracted from the native kind, by ſubliming it with a portion of ſea ſalt. The ſmalleſt quantity of cryſtalline *arſenick*, being mixed with any metal, abſolutely deſtroys its malleability; and a ſingle grain will turn a pound of copper into a beautiful ſeeming ſilver, but without ductility. *Red arſenick* is a preparation of the white, made by adding to it a mineral ſulphur. *Chambers.*—*Arſenick* is a very deadly poiſon; held to the fire, it emits fumes, but liquates very little. *Woodward.*

(8.) ARSENIC, MEDICAL PRESCRIPTIONS OF. Notwithſtanding the dreadful effects of arſenic, when taken in large quantity, attempts have not been wanting to introduce it into the materia medica. The diſeaſe, indeed, in which they have been recommended, (the cancer) is of a very incurable nature, at leaſt by ordinary medicines.—M. le Febure, a French, phyſician, ſome time ago publiſhed a treatiſe, in which he recommended pure white arſenic, as a ſpecific in that diſtemper. The doſe was four French grains, equal to 3¼ Engliſh, diſſolved in a French pint (32 troy ounces) of diſtilled water. A table ſpoonful of this ſolution is to be taken with an equal quantity of milk, and half an ounce of ſyrup of poppies, every morning faſting, and taking care to take nothing for an hour after. This courſe muſt be continued 8 days; after which, a doſe is to be taken twice every day in the ſame manner, one in the morning, and another at twelve at night. At the end of a fortnight, three doſes may be exhibited daily, the third being taken at mid-day.—Thus people of a weakly conſtitution may continue till the cure is completed; but ſuch as are more robuſt, may gradually augment the doſe, till two table ſpoonfuls are taken at each time, with as much milk, and half an ounce of ſyrup

of

of poppies. Children muſt on no account take more than three tea ſpoonfuls a day, with a proportional quantity of ſyrup of poppies. For adults, the ſtrength of the ſolution, as well as the quantity, is to be augmented; ſix grains being put into the ſecond bottle, and eight into the third; and a purgative, compoſed of manna, rhubarb, and ſal ſeignette, is to be given every eight or twelve days. An iſſue he conſiders as uſeful in every caſe. The tumour, if not ulcerated, ought to be waſhed with a ſolution of arſenic, in the proportion of eight grains to a pint; and he adviſes the following cataplaſm. "Take of carrot juice one pound, of ſugar of lead half an ounce, of liquid laudanum a dram and an half; form the whole into a maſs with as much powder of hemlock as is ſufficient for the purpoſe. The tumour is to be covered to a moderate thickneſs with this cataplaſm, which is to be kept on by a diachylon plaſter." When the cancer is of the ulcerated kind, he directs the ichorous ſeroſity to be taken away by means of dry *charpee* at each dreſſing, and the ſore to be fomented with the arſenical ſolution with the chill taken off it, and having about a third part of red wine added to it. When the ſore is of a very bad kind, he propoſes the arſenic to be diſſolved in decoction of bark for the purpoſe of fomentation; after which, the cataplaſm and plaſter are to be applied, and this is to be renewed every twelve hours. Mr Le Febure aſſerts, that the arſenic, when taken with the precautions juſt mentioned, is not attended with any bad conſequences, nor has it a diſagreeable taſte. Its action is ſcarcely perceived on any of the ſecretions or excretions; though ſome diſcharge their urine more freely than uſual, and with ſome the belly is more looſe. In ſome, the perſpiration is more copious; but theſe effects are neither regular nor conſtant. He does not conſider it as an infallible cure for the diſtemper in every poſſible ſtage; but thinks, that the diſeaſe is incurable, when, in its progreſs, it has eroded a blood-veſſel, and occaſioned a conſiderable hemorrhagy; alſo when the patient is of a hectic or phthiſical habit of body. With reſpect to regimen, he directs whey, with twelve grains of nitre to the bottle, or a weak decoction of althea, with an equal quantity of nitre; and to abſtain from wine and fermented liquors. Broth made with beef, veal, or chicken, is alſo proper. Mr Bergman informs us, that "it can hardly be doubted but arſenic may be applied to valuable purpoſes in medicine, and experiments have long ago put that out of doubt; but with reſpect both to its doſe and preparation, the utmoſt caution is neceſſary."

(9.) ARSENIC, MEDICAL USE OF, DISAPPROVED. Dr BLACK, ſays, he has ſeen the internal exhibition of arſenic, in thoſe caſes where it is recommended by foreign phyſicians, attended with very dangerous conſequences, ſuch as hectics, &c. He has likewiſe known obſtinate ulcers healed by it. Yet though the external uſe of arſenic has proved ſucceſsful in ſome caſes, it has often, even in this way, produced very terrible conſequences: for that the Doctor, far from recommending the internal uſe of it, reprobates it even in external applications.

(10.) ARSENIC, MEDICAL USE OF, PROVED BENEFICIAL. The following account of the uſe of arſenic in medicine, is given by Dr ANDREW DUNCAN. "Notwithſtanding, however, the very violent effects of arſenic, it has been employed in the cure of diſeaſes, both as applied externally and as taken internally. Externally, white arſenic, has been chiefly employed in caſes of cancer; and, as uſed in this way, it is ſuppoſed, that its good effects depend on its acting as a peculiar corroſive: and it is imagined, that arſenic is the baſis of a remedy long celebrated in cancer, which, however, is ſtill kept a ſecret by a family of the name of Plunket, in Ireland. According to the beſt conjectures, their application conſiſts of the powder of ſome vegetables, particularly the ranunculus flammeus, and cotula fœtida, with a conſiderable proportion of ſulphur, intimately mixed together. This powder, made into a paſte with the white of an egg, is applied to the cancerous part, which it is intended to corrode; and being covered with a piece of thin bladder, ſmeared alſo with the white of an egg, it is ſuffered to lie on from 24 to 48 hours; and afterwards, the eſchar is to be treated with ſoftening digeſtive, as in other caſes. Arſenic, in ſubſtance, to the extent of an eighth of a grain for a doſe, combined with a little of the flowers of ſulphur, has been ſaid to be employed internally, in ſome very obſtinate caſes of cutaneous diſeaſes, and with the beſt effect. But of this we have no experience. Of all the diſeaſes in which white arſenic has been uſed internally, there is no one in which it has been ſo frequently and ſo ſucceſsfully employed as in the cure of intermittent fevers. It has long been uſed in Lincolnſhire, and ſome other of the fenny counties, under the name of the *arſenic drop*, prepared in different ways: And it is conjectured, that an article, which has had a very extenſive ſale, under the title of the *taſteleſs ague-drop*, the form of preparing which, however, is ſtill kept a ſecret, is nothing elſe but a ſolution of arſenic. But whether this be the caſe or not, we have now the moſt ſatisfactory information concerning this article, in the "Medical Reports, of the effects of Arſenic, in the cure of agues, remitting fevers, and periodic head-achs," by Dr Fowler of Stafford. He directs, that 64 grains of arſenic, reduced to a very fine powder, and mixed with as much fixed vegetable alkaline ſalt, ſhould be added to half a pound of diſtilled water in a Florence flaſk; that it ſhould be then placed in a ſand heat, and gently boiled, till the arſenic be completely diſſolved; that after the ſolution is cold, half an ounce of compound ſpirit of lavender be added to it, and as much diſtilled water, as to make the whole ſolution amount to a pound. This ſolution is taken in doſes, regulated according to the age, ſtrength, and other circumſtances of the patient, from two to twelve drops, once, twice, or oftener, in the courſe of the day. And in the diſeaſes mentioned above, particularly in intermittents, it has been found to be a ſafe and very efficacious remedy, both by Dr Fowler, and by other practitioners: but in ſome inſtances, even when given in very ſmall doſes, we have found it excite violent vomiting. But beſides this, it has alſo been alledged by ſome, that

thoſe cured of intermittents by arſenic are very liable to become phthiſical. If arſenic ſhall ever be extenſively employed internally, it will probably be moſt certain, and moſt ſafe in its operation, when brought to the ſtate of a ſalt, readily ſoluble in water."

(11.) ARSENIC, NATIVE. See § 7. and 18.

(12.) ARSENIC, OIL OF, or CAUSTIC OIL OF ARSENIC, is a butyrous liquor, like butter of antimony, prepared of arſenic, and corroſive ſublimate, being a combination of marine acid with the arſenic. It ſerves to eat off fungous fleſh, and to cleanſe carious bones, &c.

(13.) ARSENIC, RED. See § 7. and 18.

(14.) ARSENIC, REGULUS OF, is the moſt fixed and compact part of it, prepared by mixing it with pot aſhes and ſoap, then fuſing the whole, and caſting it into a mortar; upon which the heavieſt part falls to the bottom.

(15.) ARSENIC, SYMPTOMS OF BEING POISONED BY. As phyſicians are often called, in caſes where it is ſuſpected, that people have died from the effects of arſenic taken internally, Dr Black gives the following directions to the phyſician who happens to be thus employed. "He ſhould anſwer every queſtion put to him with caution, as the lives and reputations of many often depend on his opinions. The firſt queſtion uſually put is, Whether, from the ſymptoms of the patient, or the appearance of the body after death, he imagines the deceaſed died by being poiſoned with arſenic? The ſymptoms attending the taking of arſenic are, in about a quarter of an hour, ſickneſs at ſtomach, ſucceeded by vomiting, purging, burning pain in the bowels, heat and thirſt, pains and cramps in the legs and thighs, ſyncope, and death. When the body is examined, the inteſtines appear inflamed and corroded; nay, ſome ulcerations appear about the anus, even before death. But we muſt take care not to be deceived by eroſions of the ſtomach occaſioned by the gaſtric juice, which has a power of diſſolving the ſtomach after death. The difference is, that the arſenic occaſions inflammation and blackneſs, whereas none appears in the other caſe. If the perſon eſcapes, he is in danger of being afflicted by maraſmus, paralytic affections of the limbs, great debility, &c. The ſecond generally aſked is, Whether any arſenic has been found in the inteſtines? The method of diſcovering this is as follows:—The contents of the ſtomach and inteſtines ſhould be taken out and waſhed in water; and any powder it contains, ſuffered to ſeparate. If any arſenic be mixed with it, it will fall to the bottom, and muſt then be examined by the following methods. I. By laying it on a red hot iron. If it be arſenic, it will evaporate, without melting, in a thick white vapour; and this may be ſhown by the 40th part of a grain. II. We may mix ſome of it with charcoal; in which ſtate, if it be arſenic, it will emit an odour very like garlic; but this will not be perceived, unleſs it be mixed with charcoal, or ſome inflammable matter. III. We may incloſe the powder with ſome charcoal, between two poliſhed bits of copper, the edges of which are moiſtened with a lute made of two parts of fine ſand, and one of pipe clay. The plates being then bound together with a wire, and the whole made red hot, the arſenical powder will thus be metallized, and, penetrating the copper, a blackiſh ſkin will firſt appear upon it; which being rubbed off, the parts which the arſenical vapour has touched will appear of a whitiſh or lead colour. IV. We may metallize or reduce the arſenic in a glaſs tube, by means of the black flux. This is eaſily done, by mixing two or three parts of the flux with one of the powder. This mixture being put into a ſmall glaſs tube, and a heat applied ſufficient for volatalizing the arſenic, the greateſt part of it will be metallized. One end of the tube is to be left open at firſt, and then ſtopped with lint or wool; the other made red hot; and if the tube be then broken, the arſenic is found metallized. One grain of arſenic will be ſufficient for all thoſe experiments." The firſt ſymptoms which enſue on the taking of arſenic, ſhow that it is of a highly inflammatory, cauſtic, and corroſive nature with regard to the ſyſtem in general, and the inteſtines in particular: the pulſe becomes extremely weak and irritable, and this is attended with a kind of paralytic affection of the limbs, maraſmus, &c. Milk and oil have been recommended as antidotes; but the milk may curdle, and the oil will not mix with the fluids in the inteſtines. It is therefore adviſable, when a phyſician is called to a patient who has ſwallowed arſenic, to make uſe of mucilages. A friend of Dr Black's, who had no mucilage at hand, thought of the whites of eggs, and ſucceeded. After the violence of the firſt attack is over, a milk diet, opiates, &c. are proper; and ſome time after, electricity has been found of great ſervice. Some have adviſed to exhibit hepar ſulphuris, as already noticed: but this is founded, not on experience, but theory; and it cannot be ſuppoſed, that ſuch a quantity can enter the ſyſtem, as will be ſufficient for neutralizing the arſenic, and converting it into orpiment, which is the deſign of exhibiting it.

(16.) ARSENIC, VARIOUS USES OF. With regard to the other uſes of arſenic, Dr Duncan obſerves, that "Philoſophers are wont to evince the extraordinary poroſity of bodies, and the wonderful ſubtilty of vapours, by a ſympathetic ink made with orpiment and lime (See the SYMPATHETIC), for writing, made with vinegar of litharge, by itſelf inviſible, expoſed to the vapour of this liquor becomes in a few minutes brown, even though a great many folds of paper be interpoſed. Wines naturally acid, or grown ſo by age, ſtill continue to be edulcorated by lead, notwithſtanding the puniſhments attending the detection of this fraud: It is therefore of great conſequence to be in poſſeſſion of an eaſy method of diſcovering ſuch a ſophiſtication. For this purpoſe a probatory liquor has been recommended, compoſed of cauſtic, fixed alkali, and orpiment; which inſtantly throws down a black or dark brown precipitate in conſequence of the union of the ſulphur of the orpiment with the metal. The ſame effect will take place on the addition of common hepar ſulphuris; but methods have been contrived of eluding this proof. If a ſmall quantity of chalk be contained in the wine, the ſaline hepar does not produce the intended effect; for the falling of the white calcareous earth diminiſhes the

he blackneſs. The other probatory liquor is alſo endered ineffectual by a large quantity of tartar; ecauſe the tartareous acid uniting with the lime, orms a kind of ſelenite, which in like manner diminiſhes the blackneſs. Arſenic ſometimes enters netallic compoſitions, eſpecially copper and tin; ut it were much to be wiſhed that ſuch compoitions were baniſhed, at leaſt from the kitchen. hot made of lead is ſometimes hardened by ornment. Regulus of arſenic enters into the comolition of Meuder's phoſphorus. The power of he calx in vitrification was long ago known to Geber; and it is frequently employed in glaſsouſes, either for facilitating fuſion, for acquiring certain degree of opacity, or finally for carrying off phlogiſton. The method in which mountain-cryſtals, placed over orpiment, white arſenic, rude antimony, and ſal ammoniac, mixed in a rucible, are tinged by means of heat, is deſcribed y Neri, and upon trial is found to be true. I ave thus obtained theſe cryſtals beautifully marked with red, yellow, and opal ſpots; but at the ame time cracked, which could ſcarcely be aoided. In painting, too, the artiſts ſometimes mploy arſenic. Painters in oil frequently uſe oth orpiment and realgar; and it is probable hat wood covered with a pigment mixed with hite arſenic would not be ſpoiled by worms.— moſt beautiful green pigment may be precipiated from blue vitriol by means of white arſenic iſſolved in water, together with vegetable alkali. This prepared either with water or oil, affords a olour which ſuffers no change in many years.— The playthings of children, however, ſhould not e painted with this or any other preparation of rſenic, on account of their cuſtom of putting ery thing into their mouths." Arſenic is alſo uſed in dying, and the yellow combination of it ith ſulphur has the property of readily diſſolving ndigo; for which purpoſe it is uſed in cloth-printng. It lets it fall again, however, on expoſure o the air; and therefore can be employed only in encil-colours, where a large quantity is laid on t once. The neutral arſenical ſalt is uſed in ome manufactures in France; but for what purpoſes is not known.

(17.) ARSENIC, WHITE. See § 7 and 18.

(18) ARSENIC, YELLOW, or NATIVE, is called *orpiment*. Our yellow and red arſenic are artificial, being only white arſenic mixed with different proportions of ſulphur. The white is the ſtrongeſt, the yellow is weaker, and the red weakeſt. White arſenic, ſublimed with one tenth of its weight of ſulphur, is yellow; and with one fifth it is red. Both the yellow and the red foſſil arſenics, when of a ſmooth texture, are called ARNICHES; but when compoſed of ſmall ſcales or leaves, they are called *auripigmenta*, or *orpiments*.

* ARSENICAL. *adj.* [from *arſenick*.] Containing *arſenick*; conſiſting of arſenick.—An hereditary conſumption, or one engendered by *arſenical* fumes under ground, is incapable of cure. *Harvey*.

ARSENICAL MAGNET, MAGNES ARSENICALIS, is a preparation of antimony, with ſulphur and white arſenic.

(1) ARSENIUS, a deacon of the Roman church of great learning and piety, who was pitched upon by the pope to go to the emperor Theodoſius, as tutor to his ſon Arcadius. Arſenius arrived at Conſtantinople, A. D. 383. The emperor, happening one day to go into the room where Arſenius was inſtructing his pupil, found Arcadius ſeated and the preceptor ſtanding; at this he was exceedingly diſpleaſed, took from his ſon the imperial ornaments, made Arſenius ſit in his place, and ordered Arcadius for the future to receive his leſſons ſtanding uncovered. Arcadius, however, profited but little by his tutor's inſtructions, for ſome time after he formed a deſign of diſpatching him. The officer to whom Arcadius had applied for this purpoſe, divulged the affair to Arſenius, who retired to the deſerts of Scete, where he paſſed many years in exerciſes of devotion, and died aged 95.

(2.) ARSENIUS, biſhop of Conſtantinople, in the 13th century. He was a ſtrict church dignitary, and excommunicated Michael Paleologus, for taking the imperial crown from John Laſcaris, the ſon of Theodore. Though Michael ſolicited abſolution, the biſhop refuſed, unleſs he would reſtore the crown; in conſequence of which Arſenius was baniſhed to a ſmall iſland, where he died.

ARSENOTHELYS, [from ἄρσην and θῆλυς, male and female.] among ancient naturaliſts, the ſame with hermaphrodite.

ARSES, or ARSAMES, king of Perſia, ſucceeded Artaxerxes Ochus, about A. M. 3612, and after a ſhort reign of leſs than 4 years was ſlain by Bagoas, who had murdered his predeceſſor, and ſucceeded by Darius Coddomannus.

* ARSE-SMART. *n. ſ.* [*perſicaria*, Lat.] An herb.

* ARSE, TO HANG AN. A vulgar phraſe, ſignifying to be tardy, ſluggiſh, or dilatory.—

For Hudibras wore but one ſpur,
As wiſely knowing, could he ſtir
To active trot one ſide of's horſe,
The other would not *hang an arſe*. *Hudibras.*

ARSE-VERSE, in antiquity, a term, or formula inſcribed on doors, to prevent fire. It is ſaid to be of Tuſcan origin, where the word *arſe* ſignifies avert, and *verſe*, fire.

ARSE-VERSY. See ARSY-VERSY.

ARSHOT. See ARSCHOT.

(1.) ARSINOE, in ancient geography, the name of 15 towns, mentioned by Strabo, Ptolemy, Stephanus, &c. viz. (1—5) of five towns in Cilicia, one of which had a ſtation for ſhips; (6—8) of 3 in or near Cyprus; viz. one inland, formerly called MARIUM; another N. of it, between Acamas and Soli, and the 3d in the S. with a port, between Citrum and Salamis: 9, a ſea port in Cyrene, formerly called TEUCHIRA: 10, a town in Egypt near the W. extremity of the Arabian gulph, and S. of Hierapolis, called alſo CLEOPATRIS: 11, another in the Nomos Arſinoites, mentioned on ſome coins of Adrian, and formerly called *Crocodilorum Urbs*, from its abounding with crocodiles: Ptolemy calls this town an inland metropolis, with a port called PTOLEMAIS: 12, a ſea port of Lycia, formerly named PATARA, but called Arſinoe, by Ptolemy Philadelphus after his queen: and, (13, 14, 15,) three towns of Troglodytæ, the chief of which was ſituated near the mouth of the Arabian gulf, which towards Ethiopia

Ethiopia is terminated by a promontory called DIRE. This Arſinoe is called BERENICE, with the diſtinction *Epidires*; becauſe ſituated on a neck of land running out a great way into the ſea.

(II.) ARSINOE, the name of ſeveral princeſſes of Egypt: particularly, 1. the daughter of Ptolemy Lagus, and wife of Lyſimachus, king of Thrace: 2. the wife of Ptolemy Philadelphus, who named ſeveral towns after her.

ARSINOITES, NOMOS, an ancient diſtrict of Egypt, W. of the Heracleotes, on the weſtern banks of the Nile.

ARSIS AND THESIS, in muſic, is a term applied to compoſitions in which one part riſes and the other falls.

ARSMART, in botany. See ARSE-SMART, and PERSICARIA.

ARS NOTORIA. See ARS, § 1.

ARSON, in Engliſh law, is the malicious and wilful burning of the houſe or out-houſe of another man; which is felony at common law. This is an offence of very great malignity, and much more pernicious to the public than ſimple theft: becauſe, firſt, it is an offence againſt that right of habitation which is acquired by the law of nature as well as by the laws of ſociety; next, becauſe of the terror and confuſion that neceſſarily attends it; and, laſtly, becauſe in ſimple theft the thing ſtolen only changes its maſter, but ſtill remains *in eſſe* for the benefit of the public; whereas by burning the very ſubſtance is abſolutely deſtroyed.—It is alſo frequently more deſtructive than murder itſelf, of which too it is often the cauſe: ſince murder, attrocious as it is, ſeldom extends beyond the felonious act deſigned; whereas fire too frequently involves in the common calamity perſons unknown to the incendiary, and not intended to be hurt by him, and friends as well as enemies.

ARS THESSALICA. See ARS, § 1.

ARST-MERIGIE, a place in the pariſh of Luggan in Inverneſs-ſhire, which Mr James Grant, the miniſter, ſays, in his Statiſtical Account, "has been held ſacred by the moſt remote antiquity, and ſaid to be the burial place of ſeven kings of the ancient Caledonians." The name ſignifies in Gaelic, "the height on which a ſtandard was wont to be erected."—"It ſhould appear (he adds) from popular tradition, that thoſe kings, or eminent warriors, lived about the period when the Scots were driven by the Picts beyond the Tay, and had their ſeat of government at Dunkeld. It likewiſe appears, that of old this was a famous place for hunting; and indeed it continued to abound in deer and roes till very lately, that the introduction of ſheep, with which theſe animals never mingle, has driven them away. It is ſaid that the kings came always, with their retinue and hounds, to hunt, for the moſt part of the ſummer, on the banks of this loch, and in the neighbourhood. This is rendered the more probable, from the vicinity of the parallel roads in Glenroy, which were evidently calculated for the purpoſes of hunting, and muſt have been made by ſome perſons of more power and conſequence, than any uſually reſiding in this country. In the middle of the loch are two iſlands, one of them much leſs than the other. On the larger, are the ſide walls ſtill remaining of a very ancient building, made of common round ſtones, but cemented with mortar. This is ſaid to be the place where the kings returned from hunting, and feaſted on their game. In the neighbouring iſland, which is called *Ellan a' Cuin*, or *The Iſland of Dogs*, and ſaid to be the place where the hounds were confined, is alſo a ſtanding of a ſimilar building.

(1.) ARSURA, in ancient cuſtoms, a term uſed for the melting gold or ſilver, either to refine them, or to examine their value.—The method of doing this is explained at large in the Black Book of the Exchequer, aſcribed to Gervaiſe, in the chapter *De Officio Militis Argentarii*, being in the days of great uſe, on account of the various place and different manners in which the king's money was paid. Arſura is alſo uſed for the loſs or diminution of the metal in the trial. In this ſenſe a pound was ſaid *tot ardere denarios*, to loſe ſo many penny weights.

(2.) ARSURA, in medicine, is uſed by ſome writers, for the eryſipelas.

(3.) ARSURA, in metallurgy, is uſed for the duſt and ſweepings of ſilver-ſmiths, and others who work in ſilver, melted down; and which they call their *ſweep*.

ARSY-VERSY, *adv.* [*arſlich*, Teut.] heels over head, topſy turvey, prepoſterouſly, &c. *Bailey*.

(1.) ART. *n. ſ.* (*arte*, Fr. *ars*, Lat.) 1. The power of doing ſomething not taught by nature and inſtinct; as, to *walk* is natural, to *dance* is *art*.—*Art* is properly an habitual knowledge of certain rules and maxims, by which a man is governed and directed in his actions. *South*. 2. Science: as the liberal *arts*.—*Arts* that reſpect the mind were ever reputed nobler than thoſe that ſerve the body. *Ben Jonſon*. 3. A trade.—This obſervation is afforded us by the art of making ſugar. *Boyle*. 4. Artfulneſs; ſkill; dexterity.—

The *art* of our neceſſities is ſtrange,
That can make vile things precious. *Shakeſp.*

5. Cunning. 6. Speculation.—

I have as much of this in *art* as you;
But yet my nature could not bear it ſo. *Shak.*

(2.) ART, ADDITIONAL DEFINITION OF. Art is defined by Lord Bacon, A proper diſpoſition of the things of nature by human thought and experience, ſo as to anſwer the ſeveral purpoſes of mankind: in which ſenſe *art* ſtands oppoſed to *nature*. Art is principally uſed for a ſyſtem of rules ſerving to facilitate the performance of certain actions; in which ſenſe it ſtands oppoſed to *ſcience*, or a ſyſtem of ſpeculative principles.

(3.) ARTS, DIVISIONS OF THE. Arts are commonly divided into USEFUL, or MECHANIC, and LIBERAL, or POLITE. The former are thoſe wherein the *hand* and *body* are more concerned than the mind: of which kind are moſt of thoſe which furniſh us with the NECESSARIES of life, and are commonly known by the name of TRADES; as baking, brewing, carpentry, ſmithery, weaving, &c.—The latter are ſuch as depend more on the labour of the mind than that of the hand; they are the produce of the IMAGINATION, their eſſence conſiſts in EXPRESSION, and their end is PLEASURE. Of this kind are poetry, painting,

mufic, &c. Thefe laft are alfo termed the FINE ARTS. But indeed this laft clafs might admit of a SUBDIVISION. Under the term *Fine Arts*, for inftance, we would comprehend only thofe, which along with the exertions of the *Imagination* require alfo a high degree of delicate *manual* or *mechanical* labour; fuch as painting, engraving, fculpture, ftatuary, &c. to which may be added thofe which alfo include *utility*, fuch as architecture, furgery, &c. To the clafs of *Polite Arts*, properly and principally belong mufic, dancing, and dramatic action; and under the term *Liberal Arts*, we would comprehend poetry, grammar, logic, criticifm, rhetoric, dramatic writing, and every other literary art, which requires no exertion whatever of the hand or limbs, excepting the mere ufe of the *pen*, and that without ftudying the fmalleft delicacy of *ftroke*. But by moft authors all thefe arts are confounded under the general title *fine*, *liberal*, or *polite arts*; and therefore, although we think the above fub-divifion would be fully more proper, we fhall comply with cuftom fo far as to ufe the terms *promifcuoufly* in the following fections of this article.

(4.) ARTS, EARLIEST INVENTIONS OF SUNDRY USEFUL. Some ufeful arts muft be nearly coeval with the human race; for food, cloathing, and habitation, even in their original fimplicity, require fome art. Many other arts are of fuch antiquity as to place the inventors beyond the reach of tradition. Several have gradually crept into exiftence without an inventor. The bufy mind, however, accuftomed to a beginning in things, cannot reft till it finds or imagines a beginning to every art. The moft probable conjectures of this nature the reader may fee in the hiftorical introductions to the different articles. In all countries where the people are barbarous and illiterate, the progrefs of arts is extremely flow. It is vouched by an old French poem, that the virtues of the loadftone were known in France before the year 1180. The mariner's compafs was exhibited at Venice, A. D. 1260, by Paulus Venetus, as his own invention. John Goya of Amalphi was the firft who, many years afterward, ufed it in navigation; and alfo paffed for being the inventor. Though it was ufed in China for navigation long before it was known in Europe, yet to this day it s not fo perfect as in Europe. Inftead of fufpending it in order to make it act freely, it is placed ipon a bed of fand, by which every motion of the hip difturbs its operation? Hand-mills, termed *uerns*, were early ufed for grinding corn; and vhen corn came to be raifed in greater quaintity, orfe mills fucceeded. Water mills for grinding orn are defcribed by Vitruvius. Wind mills vere known in Greece and in Arabia as early as ie 7th century; and yet no mention is made of iem in Italy till the 14th. That they were not nown in England in the reign of Henry VIII. ppears from a houfhold book of an Earl of Norumberland, cotemporary with that king, ftarting allowance for 3 mill-horfes, "two to draw in e mill, and one to carry ftuff to the mill and o" Water mills for corn muft in England have en of a late date. The ancients had mirror affes, and employed glafs to imitate cryftal vafes d goblets; yet they never thought of ufing it in windows. In the 13th century, the Venetians were the only people who had the art of making cryftal glafs for mirrors. A clock that ftrikes the hours was unknown in Europe till the end of the 12th century. And hence the cuftom of employing men to proclaim the hours during night; which to this day continues in Germany, Flanders, and England. Galileo was the firft who conceived an idea that a pendulum might be ufeful for meafuring time; and Huygens was the firft who put the idea in execution, by making a pendulum clock. Hook, in 1660, invented a fpiral fpring for a watch, though a watch was far from being a new invention. Paper was made no earlier than the 14th century; and the invention of printing was a century later. Silk manufactures were long eftablifhed in Greece before filk worms were introduced there. The manufacturers were provided with raw filk from Perfia: but that commerce being frequently interrupted by war, two monks, in the reign of Juftinian, brought eggs of the filk worm from Hindooftan, and taught their countrymen the method of managing them.—The art of reading made a very flow progrefs. To encourage that art in England, the capital punifhment for murder was remitted, if the criminal could but read, which in law language is termed *benefit of clergy*. One would imagine that the art muft have made a very rapid progrefs when fo greatly favoured: but there is a fignal proof of the contrary; for fo fmall an edition of the Bible as 600 copies, tranflated into Engliih in the reign of Henry VIII. was not wholly fold off in three years. The people of England muft have been profoundly ignorant in Queen Elizabeth's time, when a forged claufe added to the 20th article of the Engliih creed paffed unnoticed till about 60 years ago. The difcoveries of the Portugueſe in the weft coaft of Africa afford a remarkable inftance of the flow progrefs of arts. In the beginning of the 15th century, they were totally ignorant of that coaft beyond Cape Non, in 28° Lat. N. In 1410, the celebrated Prince Henry of Portugal fitted out a fleet for difcoveries, which proceeded along the coaft to Cape Bajadore in 26° but had not courage to double it: and 76 years elapfed before this was done by Bartholomew Diaz in 1486!

(5.) ARTS, EXCITING CAUSES OF IMPROVEMENTS IN. The exertion of natural fpirit upon any particular art, promotes activity to profecute other arts. The Romans, by conftant ftudy, came to excel in the art of war, which led them naturally to improve upon other arts. Having, in the progrefs of fociety, acquired fome degree of taſte and poliſh, a talent for writing broke forth. Nevus compofed in verſe 7 books of the Punic war; befides comedies, replete with bitter raillery againſt the nobility. Ennius wrote annals, and an epic poem. Lucius Andronicus was the father of dramatic poetry in Rome. Pacuvius wrote tragedies; Plautus and Terence, comedies. Lucilius compoſed ſatires; Fabius Pictor, Cincius Alimentus, Piſo Frugi, Valerius Antius, and Cato, were rather annaliſts than hiſtorians, confining themſelves to naked facts, ranged in order of time. The genius of the Romans for the fine arts was much inflamed by Greek learning when free intercourſe between the two nations was opened.

Many

Many of thoſe who made the greateſt figure in the Roman ſtate commenced authors; Cæſar, Cicero, &c. Sylla compoſed memoirs of his own tranſactions, a work much eſteemed even in the days of Plutarch. The progreſs of art ſeldom fails to be rapid, when a people happen to be rouſed out of a torpid ſtate by ſome fortunate change of circumſtances. Proſperity, contraſted with former abaſement, gives to the mind a ſpring which is vigorouſly exerted in every new purſuit. The Athenians made but a mean figure under the tyranny of Piſiſtratus; but upon regaining their freedom and independence, they were converted into heroes. It is but a piece of juſtice due even to our enemies, to ſay, that a ſimilar rapid change has taken place among the French, ſince the late revolution. Miletus, a Greek city of Ionia, being deſtroyed by the king of Perſia, and the inhabitants made ſlaves, the Athenians, deeply affected with the miſery of their brethren, boldly attacked the king in his own dominions, and burnt the city of Sardis. In leſs than 10 years after, they gained a ſignal victory at Marathon; and, under Themiſtocles, made head againſt that prodigious army with which Xerxes threatened utter ruin to Greece. Such proſperity produced its uſual effect: arts flouriſhed with arms, and Athens became the chief theatre for ſcience as well as for the fine arts. The reign of Auguſtus Cæſar, which put an end to the rancour of civil war, and reſtored peace to Rome with the comforts of ſociety, proved an auſpicious æra for literature; and produced a cluſter of Latin hiſtorians, poets, and philoſophers, to whom the moderns are indebted for their taſte. One who makes a figure rouſes emulation in all: one catches fire from another, and the national ſpirit is every where triumphant: claſſical works are compoſed, and uſeful diſcoveries made in every art and ſcience. It is true, that the Roman government under Auguſtus was in effect deſpotic: but deſpotiſm, in that ſingle inſtance, made no obſtruction to literature, it having been the politic of that reign to *hide the tyranny* as much as poſſible. A ſimilar revolution happened in Tuſcany about 300 years ago. That country having been divided into a number of ſmall republics, the people excited by mutual petty quarrels, became ferocious and bloody, flaming with revenge for the ſlighteſt offence. Theſe republics, being united under the Great Duke of Tuſcany, enjoyed the ſweets of peace in a mild government. That comfortable revolution, which made the deeper impreſſion by a retroſpect to recent calamities, rouſed the national ſpirit, and produced ardent application to arts and literature. In Scotland, a favourable period for improvement was the reign of Robert I. after our anceſtors ſhook off the Engliſh yoke; but the domineering ſpirit of the feudal ſyſtem rendered every attempt abortive. The reſtoration, in England, in 1660, which put an end to an envenomed civil war, promoted improvements of every kind, and arts and induſtry made a rapid progreſs. Had the nation, upon that favourable turn of fortune, been bleſſed with a ſucceſſion of able and virtuous princes, to what a height might not arts and ſciences have been carried. The legiſlature of Scotland endeavoured to promote manufactures of various kinds; but in vain; for the union of the two crowns had introduced deſpotiſm into Scotland, which ſunk the genius of the people, and rendered them heartleſs and indolent. By the union of the kingdoms, indeed, liberty and many other advantages, were procured to them; but the ſalutary effects were long ſuſpended by mutual enmity, ſuch as commonly ſubſiſts between neighbouring nations, who had for ages been at war. Theſe fooliſh national prejudices wore out gradually and the eyes of the Scots were opened to the advantages of their condition; the national ſpirit was rouſed to emulate and to excel; talents were exerted, hitherto latent; and Scotland at preſent makes a figure in arts and ſciences above what it ever made while an independent kingdom. Another cauſe of activity and animation, is the being engaged in ſome important action of doubtful event; a ſtruggle for liberty, the reſiſting a potent invader, or the like. Greece, divided into ſmall ſtates frequently at war with each other, advanced literature and the fine arts to unrivalled perfection. The Corſicans, while engaged in a perilous war in defence of their liberties, exerted a vigorous national ſpirit; they founded a univerſity for arts and ſciences, a public library, and a public bank. After a long ſtupor during the dark ages of eccleſiaſtical tyranny, arts and literature revived among the turbulent ſtates of Italy. The royal ſociety in London, and the academy of ſciences in Paris were both inſtituted after civil wars that had animated the people and rouſed their activity. As the progreſs of arts and ſciences towards perfection is greatly promoted by emulation nothing is more fatal to an art or ſcience than to remove that ſpur; as happens where ſome extraordinary genius appears who ſoars above rivalſhip. Mathematics ſeem to be declining in Britain: the great NEWTON, having ſurpaſſed all the ancients, has not left to the moderns any hope of equalling him: and what man will enter the liſts who deſpairs of victory?

(6.) ARTS, FATAL CONSEQUENCE OF THE DIVISION OF LABOUR IN. In a country thinly peopled, where even neceſſary arts want hands, it is common to ſee one perſon exerciſing more arts than one: in ſeveral parts of Scotland, one man acts as a phyſician, ſurgeon, and apothecary; and formerly in various parts of Europe the trade of a barber was conjoined with thoſe profeſſions. But in every populous country, even ſimple arts are ſplit into parts, and each part has an artiſt appropriated to it. In the large towns of ancient Egypt, a phyſician was confined to a ſingle diſeaſe. In mechanic arts that method has its advantages and diſadvantages. As a hand confined to a ſingle operation becomes both expert and expeditious, a mechanic art is perfected by having its different operations, diſtributed among the greateſt number of hands. Many hands are employed in making a watch, and a ſtill greater number in manufacturing a web of woollen cloth. But although the diviſion of labour, doubtleſs, tends to the perfection of the manufactures, it is attended with the worſt of conſequences to the artiſan. Various arts or operations, carried on by the ſame man, aggrandize his *mind*, becauſe they exerciſe different faculties; and as he cannot be equally expert in

; but in its operation, he is frequently reduced introduced want of ſkill by thought and invention. the genius application, on the contrary, to a ſingle rtiſts and confines the mind to a ſingle object, s, indeed, all *thought* and *invention:* in ſuch a were made, the operator becomes dull and ſtu- s were in a *beaſt of burden.* The difference is vi- is common manners of the people: in a country s, who in want of hands, ſeveral occupations national carried on by the ſame perſon, the people eyes of the ing and converſable: in a populous of their where manufactures flouriſh, they are d to enter unſociable, and ſtready for every act of therto ex- Gothic barbarity—witneſs the riots at re in 1781, and at Birmingham, in 1791; e an in- the deſtruction of Lord Mansfield's li- vity and d Dr Prieſtley's laboratory, did a preju- mporta- e ſciences, which ages of commercial or liber- e will not compenſate for. The ſame ef- e. Gre- qually viſible in countries where an art war re- facture is confined to a certain claſs of ne artiſts is viſible in Hindooſtan, where the people le enact- ed into *caſts*, which never mix even by liberty, and where every man follows his fa- ſocieties, de. The Dutch lint boors are a ſimilar e libra- the ſame families carry on the trade from uring the n to generation; and are accordingly nd liter- and bruti ſh even beyond other Dutch Italy, The inhabitants of Buckhaven, a ſea demar- the county of Fife, were originally a co- te one reigners, invited hither to teach our peo- rotted art of fiſhing. They continue fiſhers to ſ ſcience, marry among themſelves, have little in- by re- e with their neighbours, and are dull and to a proverb.

ience. ARTS, FINE, PROGRESS OF THE. Uſe- ome ſ paved the way for fine arts. Men upon rivate the former had beſtowed every convenience ritain; their thoughts to the latter. Beauty was ll the in objects of ſight; and men of taſte at- ope themſelves to the fine arts, which multiplied he li- enjoyments and improved their benevolence.

ture and painting made an early figure in ; which afforded plenty of beautiful origi- n to be copied in theſe imitative arts. Statuary, arts ſ ſimple imitation than painting, was ſooner ught to perfection: the ſtatue of Jupiter by , and of Juno by Polycletes, though the ation of all the world, were executed long re the art of light and ſhade was known. A- dorus, and Zeuxis his diſciple, who flouriſh- the 15th Olympiad, were the firſt who figured art. Another cauſe concurred to advance ry before painting in Greece, viz. a great de- for ſtatues of their gods. Architecture, as e art, made a ſlower progreſs. Proportions which its elegance chiefly depends, cannot curately aſcertained, but by an infinity of in great buildings; a model cannot be re- on: for a large and ſmall building, even of ame form, require different proportions.

(B.) ARTS, LIBERAL, HISTORY OF THE. From fine arts, mentioned in § 7, we proceed to ERATURE. It is agreed, by all antiquaries, the firſt writings were in verſe, and that writ- in proſe were of a much later date. The firſt who wrote in proſe was Pherecides Syrus: firſt Roman was Appius Cæcus, who com- Vol. II. Part II.

poſed a declamation againſt Pyrrhus. The 4 books of the Chatah Bhade, which is the ſacred book of Hindooſtan, are compoſed in verſe ſtanzas; and the Arabian compoſitions in proſe followed long after thoſe in verſe. To account for that ſingular fact, many learned pens have been employed; but without ſucceſs. By ſome it has been urged, that as memory is the only record of events where writing is unknown, hiſtory originally was compoſed in verſe for the ſake of memory. This is not ſatisfactory. To undertake the painful taſk of compoſing in verſe, merely for the ſake of memory, would require more foreſight than ever was exerted by a barbarian: not to mention that other means were uſed for preſerving the memory of remarkable events; ſuch as, heaps of ſtones, pillars, and other objects that catch the eye. The account given by Longinus is more ingenious. He obſerves, "that meaſure or verſe belongs to poetry, becauſe poetry repreſents the various paſſions with their language; for which reaſon the ancients, in their ordinary diſcourſe, delivered their thoughts in verſe rather than proſe." Longinus thought, that anciently men were more expoſed to accident and dangers, than when they were protected by good government and by fortified cities. But he ſeems not to have adverted, that fear and grief, inſpired by dangers and misfortunes, are better ſuited to humble proſe than to elevated verſe. It may be added, that however natural poetical diction may be when one is animated with any vivid paſſion, it is not ſuppoſable that the ancients never wrote or ſpoke but when excited by paſſion. Their hiſtory, their laws, their covenants, were certainly not compoſed in that tone of mind. An important article in the progreſs of the fine arts, which authors have not ſufficiently attended to, will perhaps explain this myſtery. This is the profeſſion of a bard, which ſprung up in early times, before writing was known, (ſee WRITING,) and died away gradually as writing turned more and more common. See BARD. The ſongs of the bards, being univerſally reliſhed, were certainly the firſt compoſitions that writing was employed upon; they would be carefully collected by the moſt ſkilful writers, in order to preſerve them in perpetual remembrance. The ſucceeding part of the progreſs is obvious. People acquainted with no written compoſition, but what were in verſe, compoſed in verſe their laws, their religious ceremonies, and every memorable tranſaction that was intended to be preſerved in memory by writing. But when ſubjects of writing multiplied, and became more and more involved; when people began to reaſon, to teach, and to harangue; they were obliged to deſcend to humble proſe: for to confine a writer or ſpeaker to verſe in handling ſubjects of that nature, would be a burden inſupportable. The proſe compoſitions of early HISTORIANS are all dramatic. A writer deſtitute of art is naturally prompted to relate facts, as he ſaw them performed: he introduces his perſonages as ſpeaking and conferring; and he himſelf relates what was acted, and not ſpoke. The hiſtorical books of the Old Teſtament are compoſed in that mode; and ſo addicted to the dramatic are the authors of thoſe books, that they frequently introduce God himſelf into the dialogue. At the

ſame time, the ſimplicity of that mode is happily ſuited to the poverty of every language in its early periods. The dramatic mode has a delicious effect in expreſſing ſentiment, and every thing that is ſimple and tender. Read, as an inſtance of an ordinary incident becoming, by that means, extremely intereſting, Ruth, chapter i. from 8. to 17. Indeed the whole book of Ruth almoſt is one continued inſtance. But the dramatic mode is not ſo pleaſing in relating bare hiſtorical facts. Read, as an example, the ſtory of Adonijah, in 1 Kings i. 11—49. In that paſſage there are frequent repetitions; not however by the ſame perſon, but by different perſons who have occaſion in the courſe of the ſtory to ſay the ſame things; which is natural in the dramatic mode, where things are repreſented preciſely as they were tranſacted. But the dramatic mode, however pleaſing, in many inſtances, becomes quite intolerable in a long hiſtory. In the progreſs of ſociety new appetites and new paſſions aroſe; men come to be involved with each other in various connections; incidents and events multiply, and hiſtory becomes intricate by an endleſs variety of circumſtances. Dialogue accordingly is more ſparingly uſed, and in hiſtory plain narration is mixed with it. Narration is as it were the ground-work; and dialogue is raiſed upon it, like flowers in embroidery. Homer is admitted by all to be the great maſter of that mode of compoſition. The narrative mode came in time ſo to prevail, that in a long chain of hiſtory, the writer commonly omits dialogue altogether. Early writers appear to have had little judgment in diſtinguiſhing capital facts from minute circumſtances, ſuch as can be ſupplied by the reader without being mentioned. The hiſtory of the Trojan war by Dares the Phrygian is a curious inſtance of that cold and creeping manner of compoſition. The Roman hiſtories before the time of Cicero are chronicles merely. Cato, Fabius Pictor, and Piſo, confined themſelves to naked facts. In the Auguſtæ Hiſtoriæ Scriptores, we find nothing but a dry narrative of facts, commonly of very little moment, concerning a degenerate people, without a ſingle incident that can rouſe the imagination or exerciſe the judgment. The monkiſh hiſtories are all of them compoſed in this manner. The dry narrative being very little intereſting or agreeable, a taſte for embelliſhment prompted ſome writers to be copious and verboſe. Saxo-Grammaticus, who in the 17th century compoſed in Latin a hiſtory of Denmark, ſurpriſingly pure at that early period, is extremely verboſe and full of tautologies. Such a ſtyle, at the beſt unpleaſant, is intolerable in a modern tongue, before it is enriched with a ſtock of phraſes for expreſſing aptly the great variety of incidents that enter into hiſtory. The perfection of hiſtorical compoſition, which writers at laſt attain to, after wandering through various imperfect modes, is a relation of intereſting facts, connected with their motives and conſequences. A hiſtory of that nature is a connected chain of cauſes and effects. The hiſtory of Thucydides, and ſtill more that of Tacitus, are ſhining inſtances of this mode. ELOQUENCE was of a later date than the art of literary compoſition; for till the latter was improved, there were no models for ſtudying the former. Cicero's oration for Roſcius is compoſed in a ſtyle diffuſe and highly ornamented; which, ſays Plutarch, was univerſally approved, becauſe at that time the ſtyle in Aſia, introduced into Rome with its luxury, was in high vogue. But Cicero, in a journey to Greece, where he leiſurely ſtudied Greek authors, was taught to prune off ſuperfluities, and to purify his ſtyle, which he did to a high degree of refinement. He introduced into his native tongue a ſweetneſs, a grace, a majeſty that ſurpriſed the world, and even the Romans themſelves. Eloquence triumphs in a popular aſſembly, makes ſome figure in a court of law compoſed of many judges; very little where there is but a ſingle judge, and none at all in a deſpotic government. Eloquence flouriſhed in the republics of Athens and of Rome; and makes ſome figure at preſent in a Britiſh houſe of Commons. The GREEK STAGE has been juſtly admired among all polite nations. The TRAGEDIES of Sophocles and Euripides in particular are by all critics held to be perfect in their kind, excellent models for imitation, but far above rivalſhip. That the Greek ſtage was ſo early brought to maturity, is a phenomenon not a little ſingular in the progreſs of arts. The Greek tragedy made a rapid progreſs from Theſpis to Sophocles and Euripides, whoſe compoſitions are wonderful productions of genius, conſidering that the Greeks at that period were but beginning to emerge from barbarity into a taſte for literature. The compoſitions of Eſchylus, Sophocles, and Euripides muſt have been highly reliſhed among a people who had no idea of any thing more perfect to judge by compariſon, and every work is held to be perfect that has no rival. But it ought to be kept in view, that it was not the dialogue that chiefly enchanted the Athenians, nor variety of the paſſions repreſented, nor perfection in the actors; but machinery and pompous decoration joined with exquiſite muſic. That theſe particulars were carried to the greateſt height, we may conclude from the extravagant ſums beſtowed on them: the exhibiting a ſingle tragedy was more expenſive to the Athenians than their fleet or their army in any ſingle campaign. One would imagine, however, that theſe compoſitions were too ſimple to enchant for ever; as variety in action, ſentiment, and paſſion, is requiſite, without which the ſtage will not continue long a favourite entertainment: and yet we find not a ſingle improvement attempted after the days of Sophocles and Euripides. The manner of performance, indeed, prevented any improvement. A fluctuating paſſion and refined ſentiments would have made no figure on the Grecian ſtage. Imagine the recording ſcene betwixt Brutus and Caſſius in Julius Cæſar to be there exhibited, or the ſcene betwixt Othello in the Moor of Venice: how ſlight would be the effect, when pronounced in a maſk, and through a pipe? The workings of nature upon the countenance, and the fictions of voice expreſſive of various feelings, ſo deeply affecting in modern repreſentation, would have been entirely loſt. Had great genius had ariſen with talents for compoſing a pathetic tragedy in perfection, he would have made no figure in Greece. An edifice muſt have been erected of a moderate ſize; new actors

have been trained to act with a bare face, and to pronounce in their own voice. And after all, there remained a greater miracle ſtill to be performed, viz. a total reformation of taſte in the people of Athens. In one word, the ſimplicity of the Greek tragedy was ſuited to that manner of acting; and that manner excluded all improvements. It does not appear that the Greek COMEDY ſurpaſſed the tragedy in its progreſs toward perfection. Horace mentions three ſtages of Greek comedy. The firſt well ſuited to the rough manners of the Greeks, when Eupolis, Cratinus, and Ariſtophanes, wrote. Theſe authors repreſented on the ſtage real perſons, not even diſguiſing their names: of which we have a ſtriking inſtance in a comedy of Ariſtophanes, called *The Clouds*, where Socrates is introduced, and moſt contemptuouſly treated. This ſort of comedy, ſparing neither gods nor men, was afterwards reſtrained by the magiſtrates of Athens, ſo far as to prohibit the naming of perſons on the ſtage. This led writers to do what is done at preſent: the characters and manners of known perſons were pointed ſo much to the life, that there could be no miſtake; and the ſatire was indeed heightened by this regulation, as it was an additional pleaſure to find out the names that were meant in the repreſentation. This was termed the *middle comedy*. But as there ſtill remained too great ſcope for obloquy and licentiouſneſs, a law was made prohibiting real events or incidents to be introduced upon the ſtage. This law happily baniſhed ſatire againſt individuals, and confined it to manners and cuſtoms in general. Obedient to this law are the comedies of Menander, Philemon, and Diphilus, who flouriſhed about A. A. C. 300. And this is termed the *third ſtage* of Greek comedy. The comedies of Ariſtophanes which ſtill remain err not leſs againſt taſte than againſt decency. But the Greek comedy is ſuppoſed to have been conſiderably refined by Menander and his cotemporaries. Their works, however, were far from perfection, if we can draw any conjecture from their imitator Plautus, who wrote about a century later. Plautus was a writer of genius, and it may be reaſonably ſuppoſed that his copies did not fall much ſhort of the originals, at leaſt in matters that can be faithfully copied; and he ſhows very little art, either in his compoſitions or in the conduct of his pieces. The ſubject of almoſt every piece is a young man in love with a muſic girl, deſiring to purchaſe her from the procurer, and employing a favourite ſlave to cheat his father out of the price; and the different ways of accompliſhing the cheat is all the variety we find. In ſome few of his comedies the ſtory riſes to a higher tone, the muſic girl being diſcovered to be the daughter of a freeman, which removes every obſtruction to a marriage between her and her lover. In the conduct of his pieces there is a miſerable defect of art. Inſtead of unfolding the ſubject in the progreſs of the action, as is done by Terence, and by every modern writer, Plautus introduces a perſon for no other end but to explain the ſtory to the audience. In one of his comedies, a *houſhold god* is ſo obliging as not only to unfold the ſubject, but to relate before-hand every particular that is to be repreſented, not excepting the cataſtrophe! The ROMAN THEATRE, from the time of Plautus to that of Terence, made a rapid progreſs. Ariſtotle defines comedy to be "an imitation of light and trivial ſubjects, provoking laughter." The comedies of Plautus correſpond accurately to that definition: thoſe of Terence riſe to a higher tone. Nothing is more evident than the ſuperiority of Terence above Plautus in the art of writing; and, conſidering that Terence is a later writer, nothing would appear more natural, if they did not copy the ſame originals. It may be owing to genius that Terence excelled in purity of language and propriety of dialogue; but how can we account for his ſuperiority over Plautus in the conſtruction and conduct of a play? Plautus ſurely would not imitate the worſt conſtructed plays. This difficulty does not ſeem to have occurred to any of the commentators. Had the works of Menander and of his cotemporaries been preſerved, they probably would have explained the myſtery; which for want of that light will probably remain a myſtery for ever. HOMER has for more than 2000 years been held the prince of POETS. Such perfection in an author who flouriſhed when arts were far ſhort of maturity, is truly wonderful. The nations engaged in the Trojan war are deſcribed by him as in a progreſs from the ſhepherd ſtate to that of agriculture. Frequent mention is made in the Iliad of the moſt eminent men being ſhepherds. Andromache, in particular, mentions ſeven of her brethren who were ſlain by Achilles as they tended their father's flocks. In that ſtate, garments of woollen cloth were uſed; but the ſkins of beaſts, the original clothing, were ſtill worn as an upper garment: every chief in the Iliad appears in that dreſs. Such indeed was the ſimplicity of that early period, that a *black ewe* was promiſed by each chief to the man who would undertake to be *a ſpy*. In times of ſuch ſimplicity, literature could not be far advanced; and it is a great doubt, whether there was at that time a ſingle poem of the epic kind for Homer to imitate or improve upon. Homer is undoubtedly a wonderful genius; his fire, and the boldneſs of his conceptions, are inimitable. But in that early age, it would fall little ſhort of a real miracle, to find ſuch ripeneſs of judgment, and correctneſs of execution, as in modern writers are the fruits of long experience and progreſſive improvements. That Homer is far from being ſo ripe, or ſo correct, cannot eſcape the obſervation of any reader of taſte. One ſtriking particular is, his digreſſions without end, which draw our attention from the principal ſubject. Diomedes, for inſtance, meeting with Glaucus, in the field of battle, and being in doubt, from his majeſtic appearance, whether he might not be an immortal, inquires who he was, declaring that he would not fight with a god. Glaucus inſtead of taking advantage, as one would expect, of the awe his appearance had impreſſed upon his enemy, lays hold of this ſlight opportunity, in the very heat of action to give a long hiſtory of his family! Agamemnon deſiring advice how to reſiſt the Trojans, Diomedes ſprings forward; but, before he offers advice, gives the hiſtory of all his progenitors, and of their characters, in a long train! And, after all, what was the ſage advice that required ſuch a preface? It

was, that Agamemnon ſhould exhort the Greeks to fight bravely. At any rate, was Diomedes ſo little known, as to make it neceſſary to ſuſpend the action at ſo critical a juncture, for a genealogical hiſtory? A 3d particular which merits cenſure, is an endleſs number of minute circumſtances, eſpecially in the deſcription of battles, where they are moſt improper. The capital beauty of an epic poem is, the ſelection of ſuch incidents and circumſtances as make a deep impreſſion, keeping out of view every thing trifling or familiar. An account of a ſingle battle employs the whole 5th book of the Iliad and a great part of the 6th: yet in the whole there is no general action, but unknown warriors, whom we never heard of before, killed at a diſtance with an arrow or a javelin, and every wound deſcribed with anatomical accuracy. The whole 17th book is employed in the conteſt about the dead body of Patroclus, ſtuffed with minute circumſtances, below the dignity of an epic poem. In ſuch ſcenes the reader is fatigued with endleſs particulars; and has nothing to ſupport him but the melody of Homer's verſification.

(9.) ARTS, LIBERAL, PROGRESSIVE DECLINE OF THE. Having traced the progreſs of the liberal arts toward maturity, the decline of theſe arts comes next in order. An art, in its progreſs toward maturity, is greatly promoted by emulation, but after arriving at maturity, its downfal is not leſs promoted by it. It is difficult to judge of perfection, but by compariſon; and an artiſt, ambitious to outſtrip his predeceſſors, cannot ſubmit to be an imitator, but muſt ſtrike out ſomething new, which, in an art advanced to ripeneſs, ſeldom fails to be a degeneracy. This cauſe of the decline of the fine arts may be illuſtrated by various inſtances. The perfection of vocal muſic is to accompany paſſion, and to enforce ſentiment. In ancient Greece, the province of muſic was well underſtood; which, being confined within its proper ſphere, had an enchanting influence. Harmony at that time was very little cultivated, becauſe it was of very little uſe: melody reaches the heart, and it is by it chiefly that a ſentiment is enforced, or a paſſion ſoothed: harmony, on the contrary, reaches the ear only; and it is a matter of undoubted experience, that the moſt melodious airs admit but of very ſimple harmony. Artiſts, in later times, ignorant why harmony was ſo little regarded by the ancients, applied themſelves ſeriouſly to its cultivation; and they have been wonderfully ſucceſsful. But they have been ſucceſsful at the expence of melody; which, in modern compoſitions, generally ſpeaking, is loſt amid the blaze of harmony. Theſe compoſitions tickle the ear, by the luxury of complicated ſounds, but ſeldom make any impreſſion on the heart. The Italian opera, in its form, reſembles the Greek tragedy, from which it is copied; but very little in ſubſtance. In the latter, muſic being made ſubſervient to ſentiment, the dialogue is nervous and ſublime: in the former, the whole weight is laid on muſic; and the dialogue, devoid of ſentiment, is weak and ſpiritleſs. Reſtleſs man knows no medium, but will be attempting innovations without end. By the ſame ambition, architecture has viſibly declined from its perfection. The Ionic was the favourite order when architecture was in its height of glory.—The Corinthian order came next; which, in attempting greater perfection, has deviated from the true ſimplicity of nature: and the deviation is ſtill greater in the Compoſite order. With reſpect to LITERARY productions, the firſt eſſays of the Romans were very imperfect.—We may judge of this from Plautus, whoſe compoſitions are rude, though much admired by his cotemporaries, being the beſt that exiſted at that time. The exalted ſpirit of the Romans hurried them on to the grand and beautiful; and literary productions of all kinds were in perfection when Auguſtus reigned. In attempting ſtill greater perfection, the Roman compoſitions became a ſtrange jumble of inconſiſtent parts: they were turnid and pompous, like thoſe of not a few of our modern Engliſh authors; and, at the ſame time, full of antitheſes, conceits, and tinſel wit. Every thing *new* in the fine arts pleaſes, though leſs perfect than what we are accuſtomed to; and, for that reaſon, ſuch compoſitions were generally reliſhed. We cannot diſcover, by what gradual ſteps writers, after the time of Auguſtus, deviated from the patterns that were before them; for no book of any moment after that time is preſerved, till we come down to Seneca, in whoſe works, nature and ſimplicity give place to artificial thought and baſtard wit. He was a great corrupter of the Roman taſte; and after him, nothing was reliſhed but brilliant ſtrokes of fancy, with very little regard to ſentiment: even Virgil and Cicero made no figure in compariſon. Lucan has a forced elevation of thought and ſtyle, very difficult to be ſupported; and, accordingly, he ſinks often into puerile reflections; witneſs his encomium on the river Po; which, ſays he, would equal the Danube, had it the ſame number of tributary ſtreams? Quintilian, a writer of true and claſſical taſte, who was protected and encouraged by Veſpaſian, attempted to ſtem the tide of falſe writing. His rhetoric is compoſed in an elegant ſtyle; and his obſervations contain every delicacy of the critical art. At the ſame time flouriſhed Tacitus, poſſeſſing a more extenſive knowledge of the nature of man, than any other author, ancient or modern, if Shakeſpeare be not excepted. His ſtyle is original, conciſe, compact, and comprehenſive; and, in what is properly called his *hiſtory*, perfectly correct and beautiful. He has been imitated by ſeveral, but never equalled by any. Brutus is ſaid to be the laſt of the Romans for love of liberty: Quintilian and Tacitus may be ſaid to be the laſt for literary genius. Pliny the Younger is no exception: his ſtyle is affected, turgid, and full of childiſh brilliancy. Seneca and Pliny are proper examples of writers who ſtudy *ſhow* more than ſubſtance, and who make ſenſe yield to ſound. The difference between theſe authors and thoſe of the Auguſtan age, reſembles the difference between Greek and Italian muſic. Muſic, among the Greeks, limited itſelf to the employment to which it is deſtined by nature, viz. to be the handmaid of ſenſe, to enforce, enliven, or ſweeten a ſentiment. In the Italian opera, the miſtreſs is degraded to be handmaid; and harmony triumphs, with very little regard to ſentiment.

ſentiment. Another great cauſe that precipitates the downfal of every fine art is *deſpotiſm*. The reaſon is obvious; and there is a diſmal example of it in Rome, particularly with regard to eloquence. In the decline of that art, it became faſhionable to ſtuff harangues with poetical quotations, without any view but ornament. It happened unluckily for the Romans, and for the world, that the fine arts were at their height in Rome, and not much upon the decline in Greece, when deſpotiſm put an end to the republic. Auguſtus, it is true, retarded their fall, particularly that of literature; it being the politic of his reign to hide *deſpotiſm*, and to give his government an air of *freedom*. His court was a ſchool of urbanity, where people of genius acquired that delicacy of taſte, that elevation of ſentiment, and that purity of expreſſion, which characterize the writers of his time. He honoured men of learning, admitted them to his table, and was bountiful to them. The tyranny of Tiberius, and of ſubſequent emperors, broke at laſt the elevated and independent ſpirit of the brave Romans, reduced them to abject ſlavery, and left not a ſpark of genius. The ſcience of law is the only exception, as it flouriſhed even in the worſt of times! the Roman lawyers were a reſpectable body, and leſs the object of jealouſy than the men of power and extenſive landed property.—Among the Greeks alſo, a conquered people, the fine arts decayed; but not ſo rapidly as Rome; the Greeks farther removed from the ſeat of government, being leſs within the reach of the Roman tyrants. During their depreſſion, they were guilty of the moſt puerile conceits: witneſs verſes compoſed in the form of an ax, an egg, wings, and ſuch like. The ſtyle of Greek authors, in the reign of Adrian, is unequal, obſcure, ſtiff, and affected. Lucian is the only exception. We need ſcarce any other cauſe but deſpotiſm, to account for the decline of ſtatuary and painting in Greece. Theſe arts had arrived at their utmoſt perfection, about the time of Alexander the great; and from that time they declined gradually with the vigour of a free people; for Greece was now enſlaved by the Macedonian power. It may in general be obſerved, that when a nation becomes ſtationary in that degree of power, which it acquires from its conſtitution and ſituation, the national ſpirit ſubſides, and men of talents become rare. It is ſtill worſe with a nation that is ſunk below its former power and pre-eminence; and worſt of all, when it is reduced to ſlavery. Other cauſes concurred to accelerate the downfal of the arts mentioned. Greece, in the days of Alexander, was filled with ſtatues of excellent workmanſhip; and there being little demand for more, the later ſtatuaries were reduced to make heads and buſts. At laſt the Romans put a total end, both to ſtatuary and painting in Greece, by plundering it of its fineſt pieces; and the Greeks, expoſed to the avarice of the conquerors, beſtowed no longer any money on the fine arts. The decline of the fine arts in Rome is, by Petronius Arbiter, a writer of taſte and elegance, aſcribed to a cauſe different from any above mentioned, a cauſe that overwhelms manhood, as well as the fine arts, wherever it prevails; and that is *opulence*, joined with its faithful attendants avarice and luxury. In England, the fine arts are far from ſuch perfection as to ſuffer by opulence.—They are in a progreſs, indeed, towards maturity; but they proceed at a very ſlow pace. Another cauſe that never fails to undermine a fine art in a country where it is brought to perfection, abſtracting from every one of the cauſes above mentioned, is remarked above; § 5. Nothing is more fatal to an art or ſcience, than a performance ſo much ſuperior to all of the kind, as to extinguiſh emulation. This cauſe would have been fatal to the arts of ſtatuary and painting among the Greeks, even though they had continued a free people. The decay of painting in modern Italy is probably owing to this cauſe: Michael Angelo, Raphael, Titian, &c. are lofty oaks, that bear down young plants in their neighbourhood, and intercept them from the ſunſhine of emulation. Had the art of painting made a flower progreſs in Italy, it might have there continued in vigour to this day. The decline of an art or ſcience proceeding from the foregoing cauſe, is the moſt rapid where a ſtrict compariſon can be inſtituted between the works of different maſters, as between thoſe of Newton and other mathematicians. In Italy, a talent for painting continued many years in vigour, becauſe no painter appeared with ſuch ſuperiority of genius as to carry perfection in every branch of the art. As one ſurpaſſed in deſigning, one in colouring, one in graceful attitudes, there was ſtill ſcope for emulation. But, when at laſt, there was not a ſingle perfection, but what one or other maſter had excelled in, from that period, the art began to languiſh. Architecture continued longer in vigour than painting, becauſe the principles of compariſon in the former art leſs preciſe than in the latter. The artiſt who could not rival his predeceſſors in an eſtabliſhed mode, ſought out a new mode for himſelf, which, though perhaps leſs elegant or perfect, was for a time ſupported by novelty. Uſeful arts will never be neglected in a country where there is any police; for every man finds his account in them. Fine arts are more precarious. They are not reliſhed but by perſons of taſte, who are rare; and ſuch as can ſpare great ſums for ſupporting them are ſtill more rare. For that reaſon they will never flouriſh in any country, unleſs patronized by the ſovereign, or by men of power and opulence. They merit ſuch patronage, as one of the ſprings of government; and a capital ſpring they make, by multiplying amuſements, and humanizing manners; upon which account, they have always been encouraged by good princes.

(10.) ARTS, POLITE, ESSENCE OF THE. The eſſence of the polite arts, as before obſerved, conſiſts in *expreſſion*. The end of all theſe arts is *pleaſure*; whereas the end of the ſciences is *inſtruction* and *utility*. Some of the polite arts indeed, as eloquence, poetry, and architecture, are frequently applied to objects that are uſeful, or exerciſed in matters that are inſtructive, as we ſhall ſhow more particularly in their proper place; but in theſe caſes, though the ground work belongs to thoſe ſciences which employ the underſtanding, yet the expreſſion ariſes from the inven

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tive faculty. It ſhould therefore be conſtantly remembered, that the eſſence of the polite arts conſiſts in EXPRESSION. This expreſſion lies ſometimes in the words, and ſometimes in the pen; ſometimes in ſounds and their harmony, and at others, in corporeal attitudes; ſometimes in the pencil, or in the chiſel, and at others in the graver; ſometimes in a proper diſpoſition, or judicious employment of the mechanic arts, and at others, merely in their manner of acting.

(11.) ARTS, POLITE, OBJECT OF THE. The object of all the polite arts is BEAUTY. It is not, however, ſo eaſy, as it may ſeem, to give a clear and determinate idea of what we mean by that term. (See BEAUTY.) Many able writers, who have treated expreſsly on the ſubject, have ſhown that they were ignorant what it was. It was one of thoſe expreſſions that we comprehend immediately, that leave a diſtinct impreſſion on our minds, when it is ſimply written or pronounced; but which philoſophers envelope in darkneſs, when they attempt to elucidate it by definitions and deſcriptions; and the more, as mankind have different ideas of beauty, their opinions and taſtes being as various as their underſtandings and phyſiognomies. We may ſay, however, in general, that beauty reſults from the various perfections of which an object is ſuſceptible, and which it actually poſſeſſes; and that the perfections which produce beauty conſiſt principally in the agreeable and delightful proportions which are found, 1. Between the ſeveral parts of the ſame object; 2. Between each part and the whole together; 3. Between the parts and the end or deſign of the object to which they belong. GENIUS, or invention, is the faculty of the mind by which *beauty* is produced. TASTE, diſpoſition, or rather the natural ſenſation of the mind refined by art, ſerves to guide the genius in diſcerning, embracing, and producing, that which is beautiful of every kind. See TASTE. Hence it follows, that the general theory of the polite arts is nothing more than the knowledge of what they contain that is truly beautiful and agreeable; and it is this knowledge, this theory, which modern philoſophers call by the name of *æſthetica*, or ESTHETICS.

(12.) ARTS, POLITE, RULES FOR PRACTISING. A reflection naturally ariſes on the polite arts in general. No rules whatever are capable of making a great poet, an able orator, or an excellent artiſt; becauſe the quality, neceſſary to form theſe, depends on the natural diſpoſition, the fire of genius, which no human art can confer, but which is the gift of heaven. Rules, however, will prevent a man from being a bad artiſt, a dull orator, or a wretched poet; ſeeing they are the reflections of the greateſt maſters in thoſe arts, and that they point out the rocks which the artiſt ſhould ſhun in the exerciſe of his talents. They are alſo of uſe in facilitating his labours, and in directing him to arrive by the ſhorteſt and ſureſt road to perfection. They refine, ſtrengthen, and confirm, his taſte. Nature, abandoned to herſelf has ſomething wild. Art, founded on juſt rules, gives her elegance, and dignity. Theſe general rules are of no great number. I. The firſt is, That whoever would devote himſelf to the polite arts, ſhould above all things CONSULT HIS GENIUS. This precept has been often applied to poetry, but it is equally applicable to all the polite arts; in each of which, the moſt happy ſucceſs depends upon IMAGINATION. By this term we underſtand, in general, a faculty of the mind, a particular genius, a lively imagination, a certain ſubtile ſpirit, which gives a facility in diſcovering ſomething new. But it is neceſſary alſo to preſcribe juſt bounds to this term; which muſt not here be taken in an abſolute ſenſe. Solomon remarks, that, even in his time, "there was nothing NEW under the ſun." The firſt artiſts in their imitations of nature, in their expreſſions, can borrow images, figures, compariſons, from thoſe things only that exiſt and are known. As to the novelty, of which we here ſpeak, conſiſts in the ingenious uſe of combinations of all the various objects of nature that are new, happy, and agreeable, that have not yet been exhauſted, and which appear even to be inexhauſtible; and in the uſe which the artiſt makes of all new diſcoveries, which he turns to his advantage, by a judicious application. Invention therefore ſuppoſes a conſiderable fund of preliminary knowledge, ſuch as is capable of furniſhing ideas and images to form new combinations. But there is no art by which invention itſelf can be produced; for that gift of heaven is an endowment, which even thoſe poſſeſſed of it cannot always uſe at pleaſure. We would rather ſay, therefore, that invention conſiſts in producing, in works of genius, *which is unexpected*; an object, a harmony, a perfection, a thought, an expreſſion, of which we had no idea, that we could not foreſee, nor help to find, where the artiſt has ſo happily placed it, and where we perceive it with delight. This rule appears applicable to ſuch of the polite arts as affect the mind by the hearing as well as by the ſight; and it is a matter that is highly eſſential. II. The 2d rule is, That every artiſt ought inceſſantly to labour in the improvement of his taſte, by acquiring that refined, and clear diſcernment, which he will be enabled to diſtinguiſh the real beauties in each object, the ornaments that are agreeable to it, and the proportions that ſubſiſt among the ſeveral parts: and by this faculty, it will be regulated in the employment of his natural talents. This labour conſiſts not only in the profound reflections he will make on the properties of objects as they relate to the fine arts, but alſo in a conſtant aſſiduous ſtudy of the great models of beauty. III. The 3d rule to be obſerved in the practice of the polite arts, is the *imitation of nature*. Every object in the univerſe has its peculiar nature, of which the artiſt ſhould never loſe ſight in his manner of treating it. It will be otherwiſe ornament his work with the moſt refined and moſt brilliant ſtrokes; but if nature be not juſtly imitated, the work muſt for ever remain imperfect. Homer himſelf has ſometimes ſinned againſt this rule. Not to mention the ridiculous and unnatural paſſions aſcribed to his deities, (wherein the general belief of the Grecian mythology might perhaps juſtify him,) he was ſurely not imitating Nature, to put into the mouth of a hero, at the moment of a deciſive battle, a harangue tedious by its exceſſive length, and which certainly could not have been [illegible]

thouſandth part of a numerous army. Indeed the imitation of nature, which appears at firſt view ſo ſimple and ſo eaſy, is of all things the moſt difficult in practice; and it requires a diſcernment ſo ſagacious, and an expreſſion ſo happy, as is rarely beſtowed on mortal man. IV. PERSPICUITY forms the 4th rule of expreſſion. In all the fine arts, an obſcure, perplexed, ambiguous, and elaborate expreſſion, is always bad. The true ſtriking beauty muſt be manifeſt and preceptible to the moſt ignorant of mankind as well as the moſt learned. Thoſe are ever falſe or inferior beauties that have occaſion for a covering, a kind of veil that may make them appear greater than they really are: true beauty wants no veil, but ſhines by its native luſtre. From the union of the true imitation of nature with perſpicuity of expreſſion ariſes that *truth* which is ſo eſſential in the productions of the fine arts. V. In all the polite arts, and all the ſubjects they embrace, there muſt neceſſarily reign an elevation of ſentiment, that expreſſes each object in the greateſt perfection of which it is ſuſceptible; that imitates nature in her moſt exalted beauty. This makes the 5th general rule. The deſign of the fine arts being to excite pleaſure by the expreſſion of that which is beautiful, every artiſt ſhould raiſe himſelf above his ſubject; and chooſing the moſt favourable light wherein to place it, ſhould there embelliſh it with the greateſt, moſt noble, and beautiful ornaments, that his own genius can ſuggeſt; ſtill, however, obſerving a ſtrict imitation of nature. VI. From the obſervation of theſe two laſt rules reſults the SUBLIME, which is the union of the greateſt perſpicuity with the ſtricteſt truth and moſt exalted elevation poſſible. It is neceſſary to remark here, that the moſt ſimple and common ſubjects are ſuſceptible of a ſublime that is agreeable to their nature. An idyl or landſcape may be as ſublime in their kinds as an epic poem or a hiſtory piece. When Moſes begins the book of Geneſis with theſe words, "In the beginning God created the heaven and the earth;" or when he tells us, that God ſaid "Let there be light, and there was light;" theſe expreſſions are ſublime in the higheſt degree, becauſe they are perfectly clear, true, and elevated. Every author ſhould therefore endeavour after the ſublime in every ſubject that he undertakes; and this makes the 6th and laſt general rule in the practice of the polite arts. See GRANDEUR and SUBLIMITY. But if he cannot attain to this, it is indiſpenſably neceſſary that he conſtantly make uſe of expreſſions that are *noble and refined*. Every thing that is *low, indecent*, or *diſagreeable*, is naturally repugnant to the ſublime, and ought to be baniſhed from all works that proceed from the liberal arts.

(II.) ART, in the ages of ſuperſtition was applied to ſeveral abſurd practices, ſuch as, ST ANSELHM'S ART, ST PAUL'S ART, &c.

(III.) ART, the ſecond perſon ſingular of the verb TO BE, of which the Engliſh language affords no variation, except by adopting the plural, by ſaying *you are*, inſtead of *thou art*. Thou *beeſt* indeed was anciently uſed, but it is quite obſolete.

(IV.) ART AND PART, in Scots law. See ACCESSORY.

ARTA, or LARTA, a town of Turkey in Europe, in Lower Albania, ſeated on the Aſdhas, 76 miles NNW. of Lepanto, and 20 NE. of Previſa. It is a pretty large town, and contains about 7000 or 8000 inhabitants, Greeks and Turks, but the former are the moſt numerous. It has a Greek Archbiſhop's See. The cathedral has 365 windows and doors, and is ſupported by above 2000 marble pillars. It was built by Michael Ducas Comnenus emperor of Conſtantinople. Arta carries on a conſiderable trade, particularly in tobacco and furs. Lon. 21. 20. E. Lat. 39. 28. N.

ARTABA, an ancient meaſure of capacity uſed by the Perſians, Medes, and Egyptians. The Perſian artaba is repreſented by Herodotus as bigger than the Attic medimnus by three Attic chœnixes: from which it appears that it was equal to $6\frac{3}{4}$ Romand modii; conſequently that it contained $166\frac{2}{3}$ pounds of wine or water, or $126\frac{2}{3}$ pounds of wheat. The Egyptian artaba contained five Roman modii, and fell ſhort of the Attic medimnus by one modius; conſequently held $133\frac{1}{3}$ pounds of water or wine, 100 lb. of wheat, or 60 of flour.

(1.) ARTABANUS, the name of ſeveral kings Parthia. See PARTHIA.

(2.) ARTABANUS, the brother of Darius I. and the uncle and murderer of Xerxes. See ARTAXERXES, N° 1.

ARTABAZUS, the ſon of Pharnaces, commanded the Parthians and Choraſmians in the famous expedition of Xerxes. After the battle of Salamis, he eſcorted the king his maſter to the Helleſpont with 60,000 choſen men; and after the battle of Platæa, in which Mardonius engaged contrary to his advice, he made a noble retreat, and returned to Aſia with 40,000 men.

ARTADA, or ARTADAR, } is uſed by ſome writers for *realgar* calcined, and commended by Paracelſus in malignant ulcers, and by Foreſtus for the cure of the polypus.

ARTALIS, Joſeph, a native of Mazara, A. D. 1628, who ſhowed an early inclination both for poetry and arms. He finiſhed his ſtudies at 15 years of age, when he fought a duel and killed his adverſary. He took ſhelter in a church and afterwards ſtudied philoſophy. Candia being beſieged by the Turks, he went to its relief, and diſplayed ſo much valour, that he was created a knight of St George. Being afterwards engaged in different rencounters and always victorious, he got the title of *Chevalier de Sang*, or the knight of blood. His literary talents obtained him the honour of being elected a member of ſeveral academies in Italy, and his military abilities procured him the favour of ſeveral princes, particularly of the Emp. Leopold I. and Erneſt Duke of Brunſwick.

ARTANITA. See LEONTOPETALON.

(1.) ARTAXATA, an ancient city, the royal reſidence and metropolis of Armenia Major, built according to a plan of Hannibal, for king Artaxias, after whom it was called. It was ſituated on a branch of the river Araxes, which formed a kind of peninſula, and ſurrounded the town like a wall, except on the ſide of the iſthmus, but this ſide was ſecured by a rampart and ditch. The town was deemed ſo ſtrong, that Lucullus, after having defated Tigranes, durſt not lay ſiege to it; but Pompey compelled him to deliver it without ſtriking a blow. It was then

levelled

levelled with the ground; but the Armenians have a tradition, that the ruins of it are ſtill to be ſeen at a place called *Ardachat*. Sir John Chardin ſays, that it has the name of *Ardachat* from Artaxias, whom in the Eaſt they call *Ardechier*. Here are the remains of a ſtately palace which the Armenians take to be that of Tiridates, who reigned in the time of Conſtantine the Great. One front of this building is but half ruined, and there are many other fine antiquities which the inhabitants call *Tact Tradat*, *i. e.* the throne of Tiridates.

(2.) ARTAXATA, or ATROPATIA, another city built alſo on the Araxes, but in the northern part of Media.

(1.) ARTAXERXES I. king of Perſia, ſirnamed LONGIMANUS, from the uncommon length of his arms, was the youngeſt ſon of Xerxes, and was raiſed to the throne, A. M. 3487, by Artabanus, the captain of the guards; who had privately murdered his father; but perſuaded the young prince that his elder brother Darius had done it; whereupon, aſſiſted by the guards, he killed Darius in his bed-chamber. But the murder and treaſon being afterwards diſcovered, Artabanus ſuffered the puniſhment he merited. Some reckon this king the Ahaſuerus who married Eſther; but, be that as it may, it is certain that he greatly favoured the Jews, by not only authoriſing them to return to Judea, and rebuild Jeruſalem, but alſo to collect money for the uſe of their temple; as well as by remitting their tribute, by encouraging their worſhip, and by making them a number of valuable preſents, &c See his letter to Ezra, chap. vii. 10—26. For an account of the other tranſactions of his reign, ſee PERSIA. He reigned about 40 years, and died, A. A. C. 447.

(2.) ARTAXERXES II, ſirnamed MNEMON, from his great memory, ſucceeded his father Darius II. A. M. 3546, but had to contend for his kingdom with his younger brother Cyrus, who was aſſiſted by the Greeks, but at laſt overcome and ſlain. It was after this battle that Xenophon diſplayed his generalſhip by his memorable retreat with his army. Artaxerxes reigned 43 years, and died A. M. 3589. See PERSIA.

(3.) ARTAXERXES III. ſirnamed OCHUS, ſon and ſucceſſor of Artaxerxes II. was murdered in the 23d year of his reign, (for which ſee PERSIA,) by Bagoas, the Eunuch: A. M. 3612.

(4.) ARTAXERXES is alſo the name given in Scripture to, and probably aſſumed by, the impoſtor Oropaſtes; who pretending to be Smerdis, the ſon of Cyrus, reigned 5 months in Perſia, after the death of Cambyſes. During his ſhort reign, the enemies of the Jews applied for and obtained, an interdict of the rebuilding of the city and temple. See Ezra iv. 7.

ARTAXIAS, the founder of the kingdom of Armenia Major. See ARMENIA, § 2 & 4, and ARTAXATA, N° 1.

ARTEDI, Peter, a famous Swediſh naturaliſt, born in 1705. He was educated at the univerſity of Upſal, where he ſtudied medicine; but his time was chiefly dedicated to ichthyology, in which he made many valuable diſcoveries. Such was the friendſhip between him and Linnæus, that the longeſt liver was to be heir of all their M. SS. He was drowned at Leyden in 1735. His *Bibliotheca Ichthyologica* and *Philoſophia Ichthyologica* were publiſhed by Linnæus in 1738.

ARTEDIA: A genus of the digynia order, belonging to the pentandria claſs of plants; and the natural method ranking under the 45th order, Umbellatæ. The involucra are pinnatifid; the floſcules of the diſc are maſculine; and the fruit is hiſpid with ſcales —There is but one ſpecies (though Dr Chambers ſays there are two) viz.

ARTEDIA SQUAMATA, with ſquamoſe fruit, a native of the Eaſt. Rewvolf found it growing on mount Libanus. It is an annual plant, whoſe roots riſe about two feet high, ſending out a few ſlender branches, garniſhed with narrow compound leaves reſembling thoſe of dill; the extremity of the ſtalk is terminated by a large umbel of white flowers, compoſed of five unequal petals. Theſe are ſucceeded by roundiſh compreſſed fruit, each having two ſeeds, whoſe borders are ſcaly.

ARTEMAS, a primitive Chriſtian preacher, ſent by Paul to ſupply the place of Titus.

(1.) ARTEMIDORUS, a Grecian teacher at Rome, who being intimate with Brutus, and hearing from him of the intended aſſaſſination of Cæſar, delivered a note to him to inform him of it as he went to the ſenate houſe, and deſired him to read it immediately, which Cæſar neglecting, he fell a ſacrifice to the plot.

(2.) ARTEMIDORUS, an ancient author, in the Antoninus Pius, famous for his Treatiſe on Dreams. He was born at Epheſus, but took upon him the ſurname of DALDIANUS in this book, from reſpect to his mother, whoſe native country was Daltis. He ſtyled himſelf *the Epheſian* in his other performances. He bought all the writing he could find concerning the explanation of dreams; travelled a great deal to get acquainted with fortune-tellers; and correſponded with ſuch people in diſtant countries, to collect old dreams, and the events ſaid to have followed them. His work of dreams conſiſted of 5 books: the 3 firſt were dedicated to one Caſſius Maximus; and the laſt two to his ſon, whom he took a good deal of pains to inſtruct in the nature and interpretation of dreams. This work contains ſome things intereſting. It was firſt printed in Greek at Venice in 1518, and Rigaltius publiſhed an edition at Paris, in Greek and Latin, in 1603, and added ſome notes. Artemidorus wrote alſo treatiſes upon Augurs and Chiromancy; which are not extant.

ARTEMIS, an epithet of Diana. See ARTEMISIA, N° IV.

(1.) ARTEMISIA, I. queen of Caria, and the daughter of Ligdamis, marched in perſon in the expedition of Xerxes againſt the Greeks, and performed wonders in the ſea fight near Salamis, A. A. C. 480. Being purſued by an Athenian veſſel, ſhe attacked one of the Perſian ſhips, commanded by Demaſithymus, king of Calyndus, her enemy, and ſunk it; on which the Athenians, thinking that her ſhip was on the ſide of the Greeks, ceaſed their purſuit: but Xerxes was the principal perſon impoſed upon in this affair; for believing ſhe had ſunk an Athenian veſſel, he declared that "the men had behaved like women, and the women like men." Xerxes intruſted her with the care of the young princes of Perſia, his ſons, who, agreeably to her advice, he abandoned [illegible]

in order to return to Asia. These great qualities did not secure her from the weakness of love: she was passionately fond of a man of Abydos, whose name was Dardanus, and was so enraged at his neglect of her, that she put out his eyes while he was asleep. This, however, did not extinguish her passion, which, perhaps being now mingled with pity and regret for what she had done, increased instead of being diminished. Whereupon she consulted the Delphian Oracle how to get rid of it, and being advised to go to Leucas, which was the usage of desperate lovers, she took the leap from thence, and was drowned and interred at that place. Many writers confound this Artemisia with the wife of Mausolus. See N° II.

(II.) ARTEMISIA, II. queen of Caria, the widow of king Mausolus, has immortalized herself by the honours which she paid to the memory of her husband. She built for him, in Halicarnassus, a very magnificent tomb, called the *Mausoleum*, which was one of the 7 wonders of the world, and from which the title of *Mausoleum* was afterwards given to all tombs remarkable for their grandeur; but she died of grief before the Mausoleum was finished. Her affection for him was so great that she is said to have drank his ashes. She appointed panegyrics to be made in honour of him, and proposed a prize of great value for the person who should compose the best. He died about the end of the 106th Olympiad, A. A. C. 351.

(III. 1.) ARTEMISIA, MUGWORT, SOUTHERNWOOD, and WORMWOOD: A genus of the polygamia superflua order, belonging to the syngenesia class of plants; and in the natural method ranking under the 49th order, *Compositæ nucamentaceæ*. The receptacle is either naked or a little downy; it has no pappus; the calyx is imbricated with roundish scales; and the corolla has no radii.—There are 23 species, of which the following are the most remarkable: viz.

1. ARTEMISIA ABROTANUM, or southernwood, which is kept in gardens for the sake of its agreeable scent, is a low shrub, seldom rising more than 3 or 4 feet high, sending out lateral shrubby branches, growing erect garnished with five briftly leaves, having an agreeable scent when bruised: the flowers are produced in spikes from the extremity of the branches; but unless the autumn proves warm, they seldom open in England.

2. ARTEMISIA ABSINTHIUM, or common wormwood grows naturally in lanes and uncultivated places, and is too well known to require any particular description.

3. ARTEMISIA ARBORESCENS, or tree-wormwood, grows naturally in Italy and the Levant, near the sea. It rises, with a woody stalk, 6 or 8 feet high, sending out many ligneous branches, garnished with leaves somewhat like those of the common wormwood, but more finely divided, and much whiter. The branches are terminated by spikes of globular flowers in the autumn, which are seldom succeeded by seeds in this country.

4. ARTEMISIA DRACUNCULUS, or TARRAGON, is frequently used in sallads, especially by the French, and is a very hardy plant, spreading greatly by its creeping roots.

5. ARTEMISIA MARITIMA, or sea wormwood, grows naturally on the sea-coasts in most parts of Britain, where there are several varieties, if not distinct species, to be found. These are low under shrubs, most of which creep at the root, by which they multiply greatly in their natural situation, but when transplanted into gardens seldom thrive so well.

6. ARTEMISIA PONTICA, or Pontic wormwood, commonly called *Roman wormwood*, is a low herbaceous plant, whose stalks die in autumn, and new ones appear in the spring. They are garnished with finely divided leaves, whose under sides are woolly; and the upper part of the stalks are furnished with globular flowers which nod on one side, having naked receptacles. These appear in August, but are rarely succeeded by seeds in Britain.

7. ARTEMISIA SANTONICUM produces the semen santonicum, which is much used for worms in children. It grows naturally in Persia, from whence the seeds are brought to Europe. It hath the appearance of our wild mugwort; the branches are slender, erect, and garnished with linear winged leaves, and terminated by recurved slender spikes of flowers which have naked receptacles.

9. ARTEMISIA VULGARIS, or common mugwort, grows naturally on banks and by the sides of foot paths in many parts of Britain; so is seldom admitted into gardens, where it would prove a troublesome weed, as it spreads very fast by its creeping roots. It flowers in June, at which time the plant is ready for use.

(2.) ARTEMISIA, CULTURE OF THE. The southernwood is propagated by slips or cuttings planted in a shady border about the beginning of April, observing to water them duly in dry weather. In this border they may remain till the following autumn, when they should be transplanted, either into pots or those parts of the garden where they are to remain. The santonicum is likewise propagated by slips: but the plants should be placed in a dry soil and sheltered situation, where they will endure the cold of our ordinary winters pretty well; though it will be proper to have a plant or two in pots, which may be sheltered under a common hot-bed frame in winter, to preserve the species. The true wormwood is easily propagated in the same manner.—The cuttings must be planted in a shady border, and duly watered during the summer season, in which case they will take root freely. In autumn some of the young plants should be potted, that they may be sheltered in winter; the others may be planted in a warm border, where they will live, provided the winter proves favourable. The other sorts spread by their creeping roots; and require no culture, as they are very hardy, and will thrive any where.

(3.) ARTEMISIA, MEDICINAL USES OF THE. The seeds of the santonicum are small, light, chaffy, composed as it were of a number of thin membranous coats, of a yellowish colour, an unpleasant smell, and a very bitter taste. They are celebrated for anthelmintic virtues, which they have in common with other bitters, and are sometimes taken in this intention, either along with molasses or candied with sugar. They are not often met with genuine in the shops. The leaves of the sea, common, and Roman wormwoods, are used as stoma-

ſtomachics, but are all very diſagreeable: the Roman is the leaſt ſo, and therefore is to be preferred; but the other two kinds are generally ſubſtituted in its place. The diſtilled oil of wormwood is ſometimes made uſe of to rub on the belly as a cure for worms. The leaves of the vulgaris, or common mugwort, have a light aromatic ſmell, and an herbaceous bitteriſh taſte. They were formerly celebrated as uterine and antihyſteric: an infuſion of them is ſometimes drank, either alone or in conjunction with other ſubſtances, in ſuppreſſion of the menſtrual evacuations. This medicine is certainly a very mild one, and conſiderably cooler than moſt others to which theſe virtues are attributed. In ſome parts of this kingdom, mugwort is of common uſe as a pot-herb. It is now, however, very little employed in medicine; and it is probably with propriety that the London College have rejected it from pharmacopœia.—The moxa, ſo famous in the eaſtern countries for curing the gout by burning it on the part affected, is the lanugo or down growing on the under ſide of the leaves of a ſpecies of mugwort, ſuppoſed to be the ſame with our common ſort.—From ſome dried ſamples of this plant which were brought over to this country, Mr Miller reckons them to be the ſame, differing only in ſize; in which the Eaſt Indian kind is inferior to ours.—He ſuppoſes that the lanugo of our mugwort would be equally efficacious. The abbe Croſier ſays, the ancient Chineſe made great uſe of it in medicine. In all the northern provinces, the principal remedy for moſt diſeaſes conſiſted in making deep punctures in the body, upon which ſmall balls of the down of this plant were burnt. Theſe punctures were made with needles of gold or ſteel, without drawing blood; and all the ſkill required in the phyſician, was to determine their number and depth, and where it was neceſſary to make them. It was neceſſary that the down of the mugwort ſhould be very old; and, as every kind of fire was not proper for lighting theſe ſalutary balls, they employed mirrors made of ice or metal. The literati are not at preſent agreed whether the ſecret of curing diſeaſes by punctures be preſerved; but theſe downy balls are ſtill uſed inſtead of cupping-glaſſes in apoplectic and lithargic caſes. Girdles made of this down are alſo recommended for the ſciatica, and ſtockings quilted with it are preſcribed for the rheumatiſm in the legs. The mugwort deſtined for this purpoſe is gathered only in autumn; and care muſt be taken to pick that which has the ſhorteſt and ſofteſt down. In China, the juice of the common mugwort, when green, is uſed to ſtop ſpitting of blood: and the ſeeds are employed for the ſame purpoſe. The doſe of the latter is divided into 2 parts; one of which is reduced to aſhes, and put into water in which the other has been boiled.—Theſe aſhes, it is ſaid, when taken as ſnuff, immediately ſtop bleedings of the noſe. The Chineſe preſcribe this plant alſo with ſucceſs for dyſenteries which proceed from weakneſs, and for pleuriſies, and diſorders of the ſtomach. An infuſion of the ſtalks and buttons of mugwort is recommended to old people inſtead of tea. Mugwort was formerly conſidered there as a powerful preſervative againſt witchcraft. The ancient Chineſe books relate, that, in the 3d century of the Chriſtian æra, it was cuſtomary for people to gather this plant before ſun-riſe, and to ſuſpend it afterwards over their doors. The poets of the 7th century mention this cuſtom, and deſcribe the manner in which the ſtreets of the capital were ornamented with it about midſummer. The leaves of a ſpecies which bears prickles on the edges of its leaves, when dried, are beaten with a wooden bat until the ſoft part is entirely ſeparated from the fibres: and, after they have been dipped in water mixed with ſaltpetre, they are uſed for tinder; no other kind is known at Peking; and it is equal to that of Europe. It appears that the ancient Chineſe made uſe of the ſoft part of this plant for quilting, for making mattreſſes, and even for cloth. They alſo employed it for manufacturing a kind of paper.

(IV.) ARTEMISIA, yearly feſtivals anciently obſerved in divers cities in Greece, particularly Delphi, in honour of Diana Artemis. In the Artemiſia, a mullet was ſacrificed to this goddeſs, as being thought to bear ſome reſemblance to her, becauſe it is ſaid to hunt and kill the ſea hare.

(1.) ARTEMISIUM, a promontory on the N. E. of Eubœa, (called LEON and CALE ACTE, by Ptolemy), memorable for the firſt ſea engagements between the Grecks and Xerxes, of which Dr Gillies gives the following particular account.—"The Grecian fleet was ſtationed in the harbour; while that of the Perſians, too numerous for any harbour to contain, had anchored between the city of Caſtanæa and the promontory of Sepias, on the coaſt of Theſſaly. The firſt line of their fleet was ſheltered by the coaſt of Theſſaly; but the other lines, to the number of 7, rode at anchor, at ſmall intervals, with the prows of the veſſels turned to the ſea. When they adopted this arrangement the waters were ſmooth, the ſky clear, the weather calm and ſerene: but on the morning of the 2d day after their arrival on the coaſt, the ſky began to lour; the appearance of the heavens grew threatening and terrible; a dreadful ſtorm ſucceeded; raged for 3 days with unabating fury; and deſtroyed 400 gallys, beſides a vaſt number of ſtore ſhips and tranſports. However 800 ſhips of war, beſides innumerable veſſels of burthen, ſailed into the Pegaſean bay, and anchored in the road of Aphete, directly oppoſite to the harbour of Artemiſium. The Grecians had poſted centinels on the heights of Eubœa, to obſerve the conſequences of the ſtorm, and to watch the motions of the enemy. When informed of the diſaſter which had befallen them, they poured out a joyous libation, and ſacrificed with pious gratitude, to "*Neptune the Deliverer*." The Perſians, however, having recovered from the terrors of the ſtorm, prepared for battle; and as they entertained not the ſmalleſt doubt of conquering, they detached 200 of their beſt ſailing veſſels round the iſle of Eubœa, to intercept the expected flight of the enemy through the narrow Euripus. About ſun ſet, the Grecian fleet approached in a line; and the Perſians met them with the confidence of victory, as their ſhips were ſtill ſufficiently numerous to ſurround their opponents. At their firſt ſignal, the [illegible] formed into a circle, at the ſecond they [illegible]

fight. Though crowded into a narrow compass, and having the enemy on every side, they soon took 30 of their ships, and sunk many more.—Night came on, accompanied with an impetuous storm of rain and thunder; the Greeks retired into the harbour of Artemisium; the enemy were driven to the coast of Thessaly. By good fortune, however, rather than by design, the greatest part of the Persian fleet escaped immediate destruction, and gained the Pegasean bay; but the ships ordered to sail round Eubœa met with a more dreadful disaster. They were overtaken by the storm, after they had adventured further from the shore than was usual with the wary mariners of antiquity. Clouds soon intercepted the stars, by which alone they directed their course; and after continuing during the greatest part of the night the sport of the elements, they all perished miserably amidst the shoals and rocks of an unknown coast. The morning arose with different prospects and hopes to the Persians and Greeks. To the former it discovered the extent of their misfortunes; to the latter it brought a reinforcement of 53 Athenian ships. Encouraged by this favourable circumstance, they determined again to attack the enemy, at the same hour as on the preceding day, because their knowledge of the coast, and their skill in fighting their ships rendered the dusk peculiarly propitious to their designs. At the appointed time, they sailed towards the road of Aphetæ; and having cut off the Cilician squadron from the rest, totaly destroyed it, and returned at night to Artemisium. The Persian commanders being deeply affected with their repeated disasters, but still more alarmed at the much dreaded resentment of their king, determined to make one vigorous effort for restoring the glory of their arms. By art and stratagem, and under favour of the night, the Greeks had hitherto gained many important advantages. It now belonged to the Persians to choose the time for action. On the 3d day at noon, they sailed forth in the form of a crescent, still sufficiently extensive to unfold the Grecian line. The Greeks, animated by former success, were averse to decline any offer of battle; yet it is probable that their admirals, and particularly Themistocles, would much rather have delayed it to a more favourable opportunity. Rage, and resentment supplied the defect of the Barbarians in skill and courage. The battle was longer, and more doubtful, than on any former occasion; many Grecian vessels were destroyed, five were taken by the Egyptians, who particularly signalized themselves on the side of the Barbarians, as the Athenians did on that of the Greeks. The persevering valour of the latter at length prevailed, the enemy retiring, and acknowledging their superiority, by leaving them possession of the dead and the wreck. But the victory cost them dear; since their vessels, particularly those of the Athenians, were reduced to very shattered condition; and their great inferiority in the number and size of their ships, made them feel more sensibly every diminution of strength."

(2.) ARTEMISIUM, a town of Oenotria, now called ST AGATHA, in Calabria, on the river Pisaurus, or la Foglia, 8 miles distant from the Tuscan Sea.

(3.) ARTEMISIUM, a town of Spain on the sea coast of Valencia, called also DIANIUM, and now DENIA, anciently possessed by the Contestani.

(1.) ARTEMON, the founder of the sect of Artemonites, who flourished about the year 210. See ARTEMONITES.

(2.) ARTEMON, a Syrian who resembled Antiochus, king of Syria, so exactly, that by the contrivance of his queen Laodice, he personated him after his death, and thus obtained the kingdom.

(3.) ARTEMON of Clazomene, the inventor of the battering ram, and the military testudo.

ARTEMONITES, in church history, Christians in the third century, who denied the divinity of Christ, asserting him to have only had a human nature, though divinely sent, and more excellent than the prophets. They seem to have been what we now call UNITARIANS.

ARTEMUS, a promontory of Valencia, called also *Cabo St Martin*, and *Punta del Emperador*.

ARTENNA, in ornithology, the name of a water bird, of the size of a hen, of a brownish colour on the back, and white on the belly; having a crooked bill, and its three fore toes connected by a membrane, but the hinder one loose. It is found on the island Tremiti in the Adriatic sea, and is supposed to be the *avis Diomedis* of the ancients.

ARTERIA ASPERA, } &c. See ANATOMY, *Index*.
ARTERIA BRONCHIALIS, }

ARTERIACA, } Medicines for disorders of the
ARTERIACS. } trachea, and the voice. Arteriacs are reduced by Galen into three kinds: 1. Such as are void of acrimony, serving to mollify the asperities of the part; such as gum tragacanth, *ater famius*, starch, milk, &c. 2. Those of an acrimonious quality, whereby they stimulate even the sound parts; such as honey, turpentine, bitter almonds, iris root, &c. 3. Those of an intermediate kind, soft and mild, yet detergent; such as butter, and preparations of almonds, honey, &c.

* ARTERIAL *adj.* [from *artery*.] That which relates to the artery; that which is contained in the artery.—As this mixture of blood and chyle passed thro' the *arterial* tube, it is pressed by two contrary forces; that of the heart driving it forward against the sides of the tube and the elastick force of the air, pressing it on the opposite sides of those air-bladders; along the surface of which this *arterial* tube creeps. *Arbuthnot*.

ARTERIA VENOSA, a name given by the ancients to the pulmonary vein, on the erroneous supposition of its being an air vessel, and that it served for the conveyance of the vital aura, from the lungs to the heart.

ARTERIES. See ANATOMY, *Index*.

ARTERIOSA VENA, or ARTERIAL VEIN, a denomination given to the pulmonary artery.

ARTERIOSUS CANALIS, a tube in the heart of the *fœtus*, which, with the *foramen ovale*, serves to maintain the circulation of the blood, and to divert it from the lungs.

(1.) * ARTERIOTOMY. *n. s.* [from ἀρτηρια, and τεμνω, to cut.] The operation of letting blood,

of future glories opened to their imaginations. "But the gay vision was destroyed at once by the commencement of a civil war. Many towns still remained in ruins, the memorial of the former wars, and the disgrace of the present. The diffused spirit of chivalry was turned upon the nation, and heroism became the tool of dissention. And the dreadful combination of civil evils was begun and consummated, at once, by the death of the renowned Arthur in battle. Thus died the incomparable hero in 542."

(3.) ARTHUR, REALITY OF, PROVED. To these observations it may not be improper to add the following account of the discovery of Arthur's tomb, which appears to be tolerably well authenticated. Henry II. the first of the Plantagenet line, being, in the last year of his reign, at Pembroke, and hearing there a Welsh bard singing to his harp the story of Arthur, concluding with an account of his death and burial in the church-yard of Glastenbury between two pyramids; the king instantly gave orders that the matter should be inquired into, and the body dug up. This was done as the king directed; and at the depth of 7 feet was found a vast stone, whereon was fastened a leaden cross, with this inscription on the inside: *Hic Jacet Septulus Inclytus Rex Arturius in Insula Avalonia;* i. e. "Here lies the famous King Arthur, buried in the isle of Avalon." Digging still lower they found the king's body in the trunk of a tree, his beautiful queen lying by him, with long flowing hair, in colour bright as gold, which however sunk into dust when touched. The king's bones were very large sized; and in his skull there were ten wounds or more, all cicatrized, except that of which he died. This discovery was made in the year 1189, as Giraldus Cambrensis tells us, who saw these bones, and examined the whole matter carefully. There was also a table containing the story, set up in the monastery of Glastenbury, and the leaden cross with the inscription remained there till the dissolution of the monastery, where it was seen by the great antiquary Leland, but what is become of it since does not appear. Of the different places above alluded to, as being distinguished by our hero's name, and serving to evince his existence, one of the principal, is ARTHUR'S SEAT, which see.

(4.) ARTHUR, SUMMARY ACCOUNT OF. To the above accounts of this British hero, it is proper to add, that Rapine represents him to have been born much earlier, than the year 501. He says, that he was born in Cornwall, in 452 or 453; succeeded his father as king of Damnonium, in 467; was created patrician by Aurelius Ambrosius, in 476; elected king of Britain in 508; assumed the imperial purple in 528, and was mortally wounded in battle, in 542, when Mordred and he meeting, they rushed upon each other with the utmost impetuosity. Mordred was killed upon the spot, but Arthur was carried into Glastenbury, where he died, aged 90, of which long period he had spent 76 years in fighting the enemies of his country.

(II.) ARTHUR, prince of Scotland, the son of king Aidan, was slain in battle fighting against the Picts, about A. D. 600.

(III.) ARTHUR, prince of Wales, eldest son of king Henry VII. died before his father in 1502, aged 17, five months after his marriage with the princess Catharine of Arragon.

ARTHURET, a village in Cumberland, S. of Longtown, near the river Kirkstop.

ARTHUR'S CASTLE, a small town in Cornwall, on the coast, near Tintagel and Boscastle.

ARTHUR'S Hall, a village in Cornwall, near Penpont and Temple-Moors.

ARTHUR'S Oven, an ancient ruin in Stirlingshire, near the Carron Works, called by Buchanan, *Templum Termini*.

ARTHUR'S SEAT, a high hill in the neighbourhood of Edinburgh, said to have been so denominated from a tradition that king Arthur surveyed the country from its summit, and had also defeated the Saxons in its neighbourhood. This hill rises by a steep and rugged ascent, till it terminates in a rocky point near 700 feet from the base, being more than double the height of the cross on the top of St Paul's, London, which is 340 feet. On the S. it is in many parts a perpendicular rock, composed of basaltic pillars, regularly pentagonal or hexagonal, about three feet in diameter, and from 40 to 50 feet in height. Contiguous upon the W. and partly connected with it at the base, are Salisbury craggs, of inferior height, but exhibiting an appearance equally singular and grand. They present to the city an awful front of broken rocks and precipices, forming a sort of natural amphitheatre of solid rock; and backward from the craggy verge above, the hill forms an extensive irregular slope, the surface affording pasture to numerous flocks of sheep. The craggs, beside ores, spars, rock-plants, and here and there it is said some precious stones, afford an inexhaustible supply of granite for paving the streets, &c. In quarrying, a part of the craggs has been worn down into a spacious shelf, having the appearance of a lofty terrace, and stretching a considerable length. From hence is a near and distinct prospect of the city with its environs and the adjacent country. But from the pinnacle called Arthur's Seat the view is more noble and extensive. The traveller may here sit and survey at his ease the centre of the kingdom, besides having a complete view of Edinburgh and its castle, on which he looks down as if seated among the clouds. In a word, the German ocean, the whole county of the Forth, the distant Grampians, and a large portion of the most populous and best cultivated part of Scotland, form a landscape sublime, various and beautiful. The denomination of this hill, derived as above, has been adduced as an argument against those who dispute the existence of the British Arthur. That derivation, however, though probable, is not without uncertainty. For *Arthur's Seat* is said to be derived, or rather corrupted, from *A'rd Sèir*, a "place or field of arrows," where people shot at a mark: And this not improperly; for among these cliffs is a dell or recluse valley, where the wind can scarcely reach, now called the *Hunter's bog*, the bottom of it being a morass. The adjacent craggs are supposed to have taken their name from the Earl of Salisbury, who, in the reign of Edward III, accompa-

nied that prince in an expedition against the Scots: Though, according to others, the genuine derivation, like that of Arthur's Seat, is from a Celtic word also corrupted.

(1.)* ARTICHOKE. *n. f.* [*artichault*, Fr.] This plant is very like the thistle, but hath large scaly heads shaped like the cone of the pine tree; the bottom of each scale, as also at the bottom of the florets, is a thick fleshy eatable substance. *Miller.*—No herbs have curled leaves, but cabbage and cabbage lettuce; none have double leaves, one belonging to the stalk, another to the fruit or seed, but the *artichoke*. *Bacon.*—*Artichokes* contain a rich, nutritious, stimulating juice. *Arbuthnot.*

(2.) ARTICHOKE, in botany. See CINARA.

(3.)* ARTICHOKE OF JERUSALEM. A species of sun flower.

* ARTICK. *adj.* [it should be written *arctick*, from ἄρκτος] Northern; under the bear. See ARCTICK.—But they would have winters like those beyond the *artick* circle; for the sun would be 80 degrees from them. *Brown.*—In the following example it is, contrary to custom, spelt after the French manner, and accented on the last syllable.—

Methinks all climes should be alike,
From tropick e'en to pole *artique*. *Dryden.*

(1.)* ARTICLE. *n. f.* [*articulus*, Lat.] 1. A part of speech, as, *the*, *an*; *the* man, *an* ox. 2. A single clause of an account; a particular part of any complex thing.—Laws touching matters of order, or changeable by the power of the church; *articles* concerning doctrine not so. *Hooker.* 3. Terms; stipulations.—I embrace these conditions; let us have *articles* between us. *Shakesp.* 4. Point of time; exact time.—If Cansfield had not, in that *article* of time given, them that brisk charge, by which other troops were ready, the king himself had been in danger. *Clarendon.*

(2.) ARTICLE, ARTICULUS, in anatomy, a joint, or juncture, of two or more bones of the body.

(3.) ARTICLE, in arithmetic, signifies the number 10, or any number justly divisible into ten parts, as 20, 30, 40, &c.

(4.) ARTICLE, in grammar, denotes a particle used in most languages for the declining of nouns, and denoting the several cases and genders thereof. The use of articles arises chiefly hence, that in languages which have no different terminations, to express the different states and circumstances of nouns, there is something required to supply that office. The Latins have no articles; but the Greeks, and most of the modern languages have had recourse to them, for fixing and ascertaining the vague signification of common and appellative names. The Greeks have their ὁ, the eastern tongues their *he emphaticum*; the Italians their *il*, *lo*, and *la*. The French their *le*, *la*, and *les*. The Germans their *der*, *das*, *dat*. The English also have 3 articles, *a*, *an*, and *the*; which, being prefixed to substantives, apply their general signification to some particular things. Some grammatians make the article a distinct part of speech; others will have it a pronoun, and others a noun adjective. See GRAMMAR. Articles are of great service in a language, as they contribute to the more neat and precise expressing of several properties and relations, which must otherwise be left. And hence one great advantage of such languages over the Latin, in that the article being either expressed or left out, makes an alteration in the sense, which the Latins cannot distinguish. Thus when the devil said to our Saviour, *Si tu es Filius Dei*, it may be either understood, "if thou art *a* son of God;" or, "if thou art *the* son of God." The Italians even prefix articles to proper names, which do not naturally need any, because they themselves signify things individually. Thus they say, *il Ariosto*, *il Tasso*, *il Petrarcha*. Even the French join the article to the proper names of kingdoms, provinces, &c. as *la Suede*, *la Normandie*. And we likewise annex it to the names of certain mountains and rivers; as The *Rhine*, The *Danube*, The *Alps*, &c. The articles are divided into *definite* and *indefinite*.

1. ARTICLE, DEFINITE. The article, *the*, is, said to be *definite* or *demonstrative*, as fixing the sense of the word it is put before, to one individual thing. *The* respects our secondary perception, and denotes individuals as known.

2. ARTICLE, INDEFINITE. The articles, *a* and *an*, are said to be *indefinite*, because applied to names taken in their general signification; as, he travelled with the port and equipage of *a* prince or *an* emperor, where the words, *a prince*, or *an* emperor may be understood of any such person. *A* or *an* respects our primary perception, and denotes individuals, as unknown.

(5.) ARTICLE, in literary composition, a small part or division of a discourse, book, or writing, &c.

(6.) ARTICLE OF DEATH, the last pangs or agony of one just expiring.

(7.) ARTICLE OF FAITH, is by some defined a point of Christian doctrine, which we are obliged to believe, as having been revealed by God himself, and allowed and established as such by the church. The thirty-nine articles were founded, for the most part, upon a body of articles compiled and published in the reign of Edward VI. They were first passed in the Convocation, and confirmed by royal authority in 1562. They were afterwards ratified anew in the year 1571, and again by Charles I. The law requires a subscription to these articles of all persons ordained to be deacons or priests, 13 El. cap. 12. of all clergymen inducted to any ecclesiastical living, by the same statute, and of licensed lecturers and curates, 13 El. cap. 12. and 13. and 14. Ch. 2. cap. 4. of the heads of colleges, of chancellors, officials and commissaries, and of school-masters. By 1 Will. 3. cap. 10. dissenting teachers are to subscribe all, except the 34th, 35th, and 36th, and part of the 20th (and in the case of Anabaptists, except also part of the 27th;) otherwise they are exempted from the benefits of the act of toleration.

(8.) ARTICLES OF THE CLERGY, ARTICULI CLERI, are certain statutes touching persons and causes ecclesiastical, made under Edw. II. and III.

(1.)* *To* ARTICLE. *v. a.* To draw up in particular articles.—He, whose life seems fair, yet if all his errours and follies were *articled* against him, the man would seem vicious and miserable. *Taylor.*

(2.)* *To* ARTICLE. *v. n.* [from the noun *article*.] To stipulate; to make terms.—He had not infringed the least tittle of what was *articled*, that they

they aimed at one mark, and three ends were concentrick. *Howel's Vocal Foreſt.*

* ARTICULAR. *adj.* [*articularis*, Lat.] Belonging to the joints.—In medicine, an epithet applied to a diſeaſe, which more immediately infeſts the joints. Thus the gout is called *morbus articularis.*

ARTICULARIS MORBUS. See laſt article.

ARTICULARIS NERVUS. See ANATOMY, *Index.*

(1.) * ARTICULATE. *adj.* [from *articulus*, Lat.] 1. Diſtinct; divided, as the parts of a limb are divided by joints; not continued in one tone, as *articulate* ſounds; that is, ſounds varied and changed at proper pauſes, in oppoſition to the voice of animals, which admit no ſuch variety, An *articulate* pronunciation, a manner of ſpeaking clear and diſtinct, in which one ſound is not confounded with another.—In ſpeaking under water, when the voice is reduced to an extreme exility, yet the *articulate* ſounds, the words, are not confounded. *Bacon.* 2. Branched out into articles.—This is a meaning little in uſe.—Henry's inſtructions were extreme curious and *articulate. Bac.*

(2.) ARTICULATE SOUNDS, are ſuch as expreſs the letters, ſyllables, or words, of an alphabet or language: ſuch are formed by the human voice, and by ſome few birds, as parrots, &c.

* *To* ARTICULATE. *v. a.* [from *article.*] 1. To form words; to utter diſtinct ſyllables; to ſpeak as a man.—The dogmatiſt knows not by what art he directs his tongue, in *articulating* ſound into voices. *Glanville.* 2. To draw up in articles.—

Theſe things, indeed, you have *articulated*,
Proclaim'd at market croſſes, read in churches,
To face the garment of rebellion
With ſome fine colour. *Shakeſpeare.*

3. To make terms; to treat. Theſe two latter ſignifications are unuſual.—

Send us to Rome
The beſt with whom we may *articulate*
For their own good and ours. *Shakeſpeare.*

* *To* ARTICULATE. *v. n.* To ſpeak diſtinctly.

ARTICULATED LIBEL, [*libellus articulatus.*] that wherein the parts of a fact are ſet forth to the judge in ſhort, diſtinct articles.

* ARTICULATELY. *adv.* [from *articulate.*] In an articulate voice.—The ſecret purpoſe of our heart, no leſs *articulately* ſpoken to God, who needs not our words to diſcern our meaning. *Decay of Piety.*

* ARTICULATENESS. *n. ſ.* [from *articulate.*] The quality of being articulate.

(1.) * ARTICULATION. *n. ſ.* [from *articulate.*] 1. The juncture, or joint of bones.—With relation to the motion of the bones in their *articulations*, there is a twofold liquor prepared for the inunction and lubrification of their heads, an oily one, and a mucilaginous, ſupplied by certain glandules ſeated in the *articulations. Ray.* 2. The act of forming words.—I conceive that an extreme ſmall, or an extreme great ſound, cannot be articulate, but that the *articulation* requireth a mediocrity of ſound. *Bacon.*—By *articulation* I mean a peculiar motion and figure of ſome parts belonging to the mouth, between the throat and lips. *Holder.* 3. [In botany.] The joints or knots in ſome plants, as the cane.

(2.) ARTICULATION, in anatomy. See ANATOMY, *Index.*

(3.) ARTICULATION, in botany, is the connection of parts that conſiſt of joints or knees, ſuch as the pods of French honey ſuckles, which when ripe divide into ſo many parts as there are knees or joints; alſo thoſe parts of plants which ſwell into nodes or joints, and which uſually ſend forth branches.

(4.) ARTICULATION, in grammar, a diſtinct pronunciation of words and ſyllables.

ARTICULUS. See ARTICLE.

* ARTIFICE. *n. ſ.* [*artificium*, Lat.] 1. Trick; fraud; ſtratagem.—It needs no legends, no ſervice in an unknown tongue; none of all theſe laborious *artifices* of ignorance; none of all theſe cloaks and coverings. *South.* 2. Art; trade; ſkill; obtained by ſcience or practice.

(1.) * ARTIFICER. *n. ſ.* [*artifex*, Lat.] 1. An artiſt; a manufacturer; one by whom any thing is made.—The lights, doors, and ſtairs, rather directed to the uſe of the gueſt, than to the eye of the *artificer. Sidney.* 2. A forger; a contriver.—

Th' *artificer* of lies
Renews th' aſſault, and his laſt batt'ry tries.
Dryden.

3. A dexterous or artful fellow: not in uſe.—

Let you alone, cunning *artificer. Ben Johnſon.*

(2.) ARTIFICERS, among the Romans, had their peculiar temples, where they aſſembled and choſe their own patron, or advocate, to defend their cauſes; they were exempted from all perſonal ſervices. Taruntenus Paternus reckons 32 ſpecies of artificers, and Conſtantine 35, who enjoyed this privilege. The artificers were incorporated into divers colleges or companies, each of which had their tutelar gods, whom they worſhipped. Several of theſe, when they quitted their profeſſion, hung up their tools, a votive offering to their gods. Artificers were held a degree below merchants, and *argentarii* or money changers, and their employment more ſordid. Some deny, that in the earlieſt ages of the Roman ſtate, artificers were ranked in the number of citizens: others, who aſſert their citizenſhip, allow that they were held in contempt, as being unfit for war, and ſo poor that they could ſcarce pay any taxes. For which reaſon they were not entered among the citizens in the cenſor's books; the deſign of the cenſus being only to ſee what number of perſons were yearly fit to bear arms, and to pay taxes towards the ſupport of the ſtate. It may be added, that much of the artificers' buſineſs was done by ſlaves and foreigners, who left little for the Romans to mind but their huſbandry and war. In almoſt all ages, till the preſent, and under moſt forms of government, artificers have been too little reſpected. By means of the arts, the minds of men are engaged in inventions beneficial to the whole community; and thus prove the grand preſervative againſt that barbariſm and brutality, which even attend indolence and induce ſtupidity. Ramazini has a treatiſe on the diſeaſes of artificers.

(3.) ARTIFICERS, LAWS RESPECTING. By the Engliſh laws, artificers in wood, iron, ſteel, braſs, or other metal, going out of the kingdom into any foreign country without licence, are to be impriſoned three months, and fined in a ſum not exceed-

ceeding 100l. And such as go abroad, and do not return on warning given by our ambassadors, &c. shall be disabled from holding lands by descent or devise, from receiving any legacy, &c. and be deemed aliens, stat. 5 Geo. I. cap. 27. By 23 Geo. II. cap. 13. § 1. Penalty is also inflicted on seducing artificers to go abroad.

(1.) * ARTIFICIAL. *adj.* [*artificiel*, Fr] . Made by art; not natural.—There is no natural motion perpetual; yet it doth not hinder but that it is possible to contrive such an *artificial* revolution. *Wilkins.* 2. Fictitious; not genuine. —The resolution which we cannot reconcile to public good, has been supported by an obsequious party, and then with usual methods confirmed by an *artificial* majority. *Swift.* 3. Artful; contrived with skill.—These seem to be more *artificial*, as those of a single person the more natural governments. *Temple.*

(2.) ARTIFICIAL is also frequently used for FACTITIOUS. Thus we have artificial sal ammoniac, artificial borax, &c.

(3.) * ARTIFICIAL ARGUMENTS. [In rhetorick.] Are proofs on considerations which arise from the genius, industry, or invention of the orator; which are thus called to distinguish them from laws, authorities, citations, and the like, which are said to be *inartificial* arguments.

(4.) ARTIFICIAL DAY, the time between the sun's rising and setting, in any position of the hemisphere.

(5.) ARTIFICIAL FIRE-WORKS are compositions of inflammable materials, chiefly used on public occasions, by way of rejoicing. See PYROTECHNY.

(6.) ARTIFICIAL LIGHTNING. See ELECTRICITY and LIGHTNING.

(7.) * ARTIFICIAL LINES, on a sector or scale, are lines so contrived as to represent the logarithmick lines and tangents; which, by the help of the line of numbers, solve, with tolerable exactness, questions in trigonometry, navigation, &c. *Chambers.*

(8.) ARTIFICIAL MAGNETS. See MAGNETS.

(9.) ARTIFICIAL MUSIC, that which is according to the rules of art; or executed by instruments invented by art. It is also used, in another sense, for some artful contrivance in music; as when a piece is sung in two parts; one whereof is by B molle, or flat, and the other by B sharp.

(10.) * ARTIFICIAL NUMBERS, are the same with logarithms.

* ARTIFICIALLY. *adv.* [from *artificial.*] 1. Artfully; with skill; with good contrivance.—How cunningly he made his faultiness less, how *artificially* he set out the torments of his own conscience. *Sidney* 2. By art; not naturally.—It is covered on all sides with earth crumbled into powder, as if it had been *artificially* sifted. *Addison.*

* ARTIFICIALNESS. *n. f.* [from *artificial.*] Artfulness. *Dict.*

* ARTIFICIOUS. *adj.* [from *artifice.*] The same with *artificial.*

ARTIGI, or ARTIGIS, a town of the Turduli, in Bætica, now called ALHAMA.

(1.) * ARTILLERY. *n. f. It has no plural.* [*artillerie*, Fr.] 1. Weapons of war; always used of five weapons.—And Jonathan gave his *artillery* to his lad, and said unto him, Go, carry them unto the city. 1 *Samuel.* 2. Cannon; great ordnance.—Upon one wing the *artillery* was drawn, being sixteen pieces, every piece having pioneers to plain the ways. *Hayward.*

(2.) ARTILLERY, ADDITIONAL DEFINITIONS OF. Artillery in its general sense, denotes, 1. the offensive apparatus of war, particularly of the missile kind. Among the French the term was anciently appropriated to ARCHERY: (See § 1, 3 and 5.) In its modern signification it signifies fire arms, mounted on their carriages and ready for action, with their balls, bombs, grenades, &c. 2. In a more extensive meaning, it includes the powder, the matches, instruments for fire works, the utensils of ordnance, the means which facilitate their motion and transport them, the vehicles over which they traverse rivers, every thing necessary to them, and all that enters into the form of a train of artillery. 3. In a sense still more extensive, the word likewise comprehends the men destined for the service of the *artillery*; the people who provide the artillery with materials and implements when engaged, the cannoniers, the bombardiers, the officers of every rank, and engineers of every kind. 4. By the term *artillery* is likewise understood the science which the officers of artillery ought to possess. This science teaches to know the nature of all the materials and ingredients which enter into the composition and the structure of every thing relative to the artillery, such as nitre, sulphur, charcoal; the properties of air and fire; the composition and preparation of gun-powder; the materials for fire works; the construction, proportions, &c. for the different warlike machines; the arrangement, movement, and whole management, of cannon, &c. in the field or in sieges, in such a manner, that each of them, according to the length of its tube and the diameter of its bore, may be situated in the best place and at the propereſt distance for execution, and that the whole train taken together may reciprocally assist and support each other with the greatest advantage.

(3.) ARTILLERY, ANCIENT. Artillery has undergone many changes from its origin to the present time. The artillery of the ancients were the catapulta, the balistæ, the different kinds of slings, &c. In latter ages, the Franks used the hatchets as a missile weapon, throwing it in the same manner as the Americans do the *tomahawk.* The Gascons and Genoese were excellent cross bow men. The Swiss owed their victories to their strength and skill in the use of the pike, halberd, and espadon or two handed sword; and the victories of Cressy, Poictiers, and Agincourt, will occasion the valour and skill of the English archers to be transmitted down to the latest posterity. See ARCHERY, § 3, and 4. The chevalier Folard was extremely attached to the ancient machines first mentioned, and seemed even to prefer them to our fire arms: an opinion which must appear not a little extraordinary from such a person.—Father Daniel might will be mistaken in the comparison which he made between the effects of ancient and modern artillery, and in his conclusion, that the latter was of little use: the situation of this good father removed him from the scenes of war, and the opportunities of military experi-

ence. But it is aſtoniſhing, that one ſo learned in the military art as the commentator of Polybius, who had ocular demonſtration of the ſucceſs of modern artillery, ſhould have declared ſo violently againſt it. Whatever be the caſe with theſe authors and their maxims, it may be aſſerted, that cannon is one of the moſt ſingular diſcoveries which have been made amongſt men; and by little and little, it has changed the whole art of war, and of conſequence, the whole ſyſtem of policy, in Europe. The æra of artillery is dated from the battle of Creſſy in 1346, becauſe it is only from that day that cannons were mentioned in battle. Edward III. of England ſucceſsfully employed ſome pieces of artillery, placed in the front of his army. The invention of artillery was then known in France, as well as in England; but probably Philip VI. marched with ſo much hurry and precipitation to attack his enemy, that he left his cannon as uſeleſs incumbrances behind him. The ignorance of that age in mechanical arts, conſiderably retarded the progreſs of artillery; and that of which they were then poſſeſſed, was ſo unwieldy and imperfect, that they could not poſſibly diſcern its importance and efficacy in practice.

(4.) ARTILLERY, MODERN, HISTORY OF. After the invention of gun powder, the Spaniards were the firſt who armed part of their foot with muſkets and harquebuſſes, and mixed them with the pikes. In this they were ſoon imitated by moſt other nations; though the Engliſh had not entirely laid aſide their favourite weapon the long bow, and generally taken to the uſe of fire arms, during the reign of queen Elizabeth. The firſt muſkets were very heavy, and could not be fired without a reſt: they had matchlocks, and barrels of a wide bore, that carried a large ball and charge of powder, and did execution at a great diſtance. The muſketeers on a march carried only their reſts and ammunition, and had boys to bear their muſkets after them, for which they were allowed great additional pay. They were very ſlow in loading, not only by reaſon of the unwieldineſs of the pieces, and becauſe they carried the powder and balls ſeparate, but from the time it took to prepare and adjuſt the match; ſo that their fire was not near ſo briſk as ours is now. Afterwards a lighter kind of matchlock muſket came into uſe; and they carried their ammunition in bandeliers, which were broad belts that came over the ſhoulder, to which were hung ſeveral little caſes of wood, covered with leather, each containing a charge of powder; the balls they carried looſe in a pouch, and they had alſo a priming horn hanging by their ſide. Matchlocks were, about the beginning of this century, univerſally diſuſed in Europe, and the troops were armed with firelocks; to which, much about the ſame time, the bayonet being added, pikes alſo were laid aſide; which latter change, whether it was for the better or not, is a point that ſtill admits of diſpute among the beſt military writers, who are divided in their opinions about it, tho' moſt of them diſapprove of it. The old Engliſh writers call thoſe large muſkets *calivers*; the harquebuſs was a lighter piece, that could be fired without a reſt. The matchlock was fired by a match, fixed by a kind of tongs in the ſerpentine or cock, which, by pulling the trigger, was brought down with great quickneſs upon the priming in the pan, over which there was a ſliding cover, which was drawn back by the hand, juſt at the time of firing. There was a great deal of nicety and care required to fit the match properly to the cock, ſo as to come down exactly true on the priming, to blow the aſhes from the coal, and to guard the pan from the ſparks that fell from it: a great deal of time was loſt in taking it out of the cock, and returning it between the fingers of the left hand, every time that the piece was fired; and wet weather often rendered the matches uſeleſs. However, moſt writers allow that they were very ſure, and leſs apt to miſs fire, than the firelock. The firelock is ſo called, from producing fire of itſelf, by the action of the flint and ſteel. The moſt ancient invention of this ſort is the wheel lock, which we find mentioned in Luigi Collado's Treatiſe of Artillery, printed at Venice, 1586, as then lately invented in Germany. This ſort of lock was uſed till within theſe hundred years, eſpecially for piſtols and carbines. It was compoſed of a ſolid ſteel wheel, with an axis, to which was faſtened a chain, which, by being round it, drew up a very ſtrong ſpring; on pulling the trigger, the ſpring acting, whirled the wheel about with great velocity, and the friction of the edge of it (which was a little notched) againſt the ſtone, produced the fire: the cock was made ſo as to bring the ſtone upon the edge of the wheel, part of which was in the pan, and touched the priming; they uſed any common hard pebble for that purpoſe, which ſerved as well as flint. Theſe locks were inconvenient, took time to wind up (or ſpan, as they termed it), and ſometimes would not go off; an inſtance of which may be ſeen in Ludlow's Memoirs. When the firelock, ſuch as we now uſe, was invented, we cannot aſcertain. It is called, by writers of about the middle of the 17th century, a *ſnaphance*, or *ſnaphance*; which being the Dutch word for a *firelock*, ſeems to indicate, that it is a Dutch invention, and that we took it from them. But Ward, in his Animadverſions of War, (printed in 1639, p. 502,) after deſcribing the exerciſe of the firelock, piſtol, and carbine, (by which he means the wheel lock,) ſays that as moſt of our pieces go with Engliſh locks, which differ from firelocks, he ſhall add the method of handling them; and then gives the exerciſe of the ſnaphine carbine; by which it appears, that there was little or no difference between that and the pieces now in uſe. The more modern writers call it a *fuſee*, from the French word *fuſil*; whence the name of fuſileers is ſtill continued to ſeveral of our regiments, which were the firſt that were armed with them on the diſuſe of matchlocks. They uſed the muſket and reſt in England, ſo late as the beginning of the civil wars, as may be ſeen in Col. Barriſt's Young Artillery Man, printed at London, 1643. Figueerra, in his embaſſy in 1518, relates, that the Perſians would neither make uſe of infantry nor of artillery, becauſe by them the impetuoſity of attack, and the facility of retreat were equally incumbered and retarded: in theſe expeditions a

one, their addreſs and their glory conſiſted.—This method of advancing and recalling is widely different from the preſent conduct of war, as the artillery in armies is now prodigiouſly multiplied, and muſt be tranſported to every place where any body of troops whatever is deſtined to operate. The length and diameter of cannon has been much diminiſhed, which muſt likewiſe proportionably diminiſh their weight. It is by long practice and experience, that they have diſcovered how much might be deducted from their magnitude in both reſpects with propriety, without hurting the grand effects which, on ſome occaſions, it is neceſſary they ſhould produce, by rendering them more eaſy to be wielded, which was the advantage purſued by leſſening their ſize. See CANNON, GUNNERY, and PROJECTILES. Improvements, however, are ſtill making, and will probably long continue to be made, in theſe ignivomous machines, that mock the thunder, which, though they ſeem to be invented for the deſtruction of the human race, and the ſubverſion of empires, have yet by their effects rendered war leſs ſavage and leſs ſanguine; political alliances have been more ſucceſsfully conciliated among all nations, conqueſts are become leſs frequent, and leſs rapid, and ſucceſſes in war have been more eaſily reduced to calculation.

(5.) ARTILLERY, MODERN, IMPORTANT CHANGES PRODUCED BY. The change introduced in the military art by the modern artillery, Dr Smith obſerves, has enhanced greatly both the expence of exerciſing and diſciplining any particular number of ſoldiers in time of peace, and that of employing them in time of war. Both their arms and their ammunition are become more expenſive. A muſket is a more expenſive machine than a javelin or a bow and arrows; a cannon or a mortar, than a baliſta or a catapulta. The powder which is ſpent in a modern review, is loſt irrecoverably, and occaſions a very conſiderable expence. The javelins and arrows which were thrown or ſhot in an ancient one, could eaſily be picked up again, and were beſides of very little value. The cannon and the mortar are not only much dearer, but much heavier machines than the baliſta or catapulta, and require a greater expence not only to prepare them for the field, but to carry them to it. As the ſuperiority of the modern artillery over that of the ancients is very great, it has become much more difficult, and conſequently, much more expenſive, to fortify a town, ſo as to reſiſt, even for a few weeks, the attack of that ſuperior artillery. In modern war, the great expence of fire arms gives an evident advantage to the nation which can beſt afford that expence; and conſequently, to an opulent and civilized, over a poor and barbarous nation. In ancient times, the opulent and civilized found it difficult to defend themſelves againſt the poor and barbarous nations. In modern times, the poor and barbarous find it difficult to defend themſelves againſt the opulent and civilized. The invention of fire arms, an invention, which at firſt ſight appears to be ſo pernicious, is certainly favourable both to the permanency and to the extenſion of civilization. It has to many appeared matter of ſurpriſe, that the battles of the ancients ſhould be deſcribed with an order, perſpicuity, and circumſtantial minuteneſs, which are not to be found in the military writers of modern times. Scholars have endeavoured to explain this difference, by obſerving the diſproportion, in point of dignity and abilities, between the military hiſtorians of modern Europe, and thoſe of Greece and Rome. But the difficulty will be better ſolved, Dr Gillies thinks, by reflecting on the changes introduced into the art of war, by the change of artillery; which in military operations, form the pivot on which the whole turns. 1. From the nature of fire arms, modern battles are involved in ſmoke and confuſion. 2. From the ſame cauſe, modern armies occupy a much greater extent of ground, and begin to act at much greater diſtances; which renders it more difficult to obſerve and aſcertain their manœuvres. 3. The immenſe train of artillery, ammunition, &c. required in the practice of modern war, gives a certain immobility to our armies, which renders it impoſſible to perform, without great danger, thoſe rapid evolutions in ſight of an enemy, which ſo often decided the battles of the ancients. With us, almoſt every thing depends on the judicious choice of ground, a matter requiring great military genius, but not admitting the embelliſhments of hiſtorical deſcription. In the battles of the Greeks and Romans, the extraordinary diſproportion between the numbers ſlain on the ſide of the victors and the vanquiſhed, has been obſerved as another remarkable circumſtance. But this neceſſarily reſulted from the nature of their arms. Their principal weapons not being miſſile, but manual, armies could not begin to act, till they had approached ſo nearly to each other, that the conquered found themſelves cut off from all poſſibility of retreat. In modern times, ſuch conſequences ſeldom take place. The uſe of fire arms (which often renders the action itſelf more bloody,) furniſhes the defeated party with various means of retreating, with conſiderable ſafety. The ſphere of military action is ſo widely extended in modern times, that before the victors can run over the ſpace which ſeparates them from the vanquiſhed, the latter may fall back, and proceed with little loſs beyond their reach; and ſhould any village, hedge, ravine, &c. be found in their way, may often check the ardour of the purſuers. Upon theſe conſiderations, the invention of gun powder and modern artillery may be ſaid to have ſaved the effuſion of human blood. Equeſtrian engagements (the principles on which cavalry act, being nearly the ſame in every age) are ſtill ſimilar in circumſtances to thoſe which appear ſo extraordinary in the battles of antiquity. Before we conclude this article, ſeveral terms relative to the artillery, require to be explained: ſuch as

1. ARTILLERY COMPANY, a band of infantry, conſiſting of 600 men, making part of the militia or city guard of London.

2. ARTILLERY GUARD is a detachment from the army, to ſecure the artillery. This corps is in the front, and the centries are round the park. Upon a march, they go in the front and rear of the artillery, and muſt be ſure to leave nothing behind. If a gun or waggon break down, the

captain is to leave a part of his guard, to assist the gunners and matrosses in getting it up again.

3. ARTILLERY PARK, the place in the rear of both lines in the army, for encamping the artillery, which is drawn up in lines, of which one is formed by the guns; the ammunition waggons make two or three lines, 60 paces behind the guns, and 30 distant from one another; the pontoons and tumbrils make the last line. The whole is surrounded with a rope which forms the park: the gunners and matrosses encamp on the flanks; and the bombardeers, pontoon-men, and artificers, in the rear.

4. ARTILLERY TRAIN, a certain number of pieces of ordnance mounted on carriages, with all their furniture fit for marching.

ARTINGTON, a village in Surry, near Godalming.

* ARTISAN. *n. s.* [French.] 1. Artist; professor of an art.—What are the most judicious *artisans*, but the mimics of nature. *Wotton.* 2. Manufacturer; low tradesman.—I who had none but generals to oppose me, must have an *artisan* for my antagonist. *Addison.*

ARTISCUS, [from ἄρτος, bread,] in medicine, denotes a troche, but more particularly that prepared of viper's flesh, mixed up with bread, to be used in the composition of Venice treacle.—These are more particularly called *artisci theriaci*, or theriacal troches. They were formerly in great vogue, and brought with much parade from Venice; but Zwelfer discovered their vanity; since which time, viper's powder has been generally substituted for them, in the preparation of the treacle.

(1.) * ARTIST. *n. s.* [*artiste* Fr.] 1. The professor of an art, generally of an art manual.—When I made this, an *artist* undertook to imitate it; but using another way fell much short. *Newton.* 2. A skilful man; not a novice.—If any one thinks himself an *artist* at this, let him number up the parts of his child's body. *Locke.*

(2.) ARTIST is defined by Mr Harris to be, "A person possessing an habitual power of becoming the cause of some effect, according to a system of various and well approved precepts." See ART, § 1 & 2. We are told of a privilege granted at Vicenza to artists, like the benefit of clergy in England; in virtue whereof, criminals adjudged to death save their lives if they can prove themselves the most consummate workman in any useful art. This benefit is allowed them, *in favorem artis*, for the first offence, except in some particular crimes, of which coining is one; for here the greater the artist, the more dangerous the person.

(3.) ARTIST, in an accademial sense, denotes a philosopher, or proficient in the faculty of arts. In the early age of universities, the 7 liberal arts completed the whole course of study, or philosophy, as it was called: whence the masters of this faculty were denominated *Artists*. These were languages, rhetoric, logic, arithmetic, music, geometry, and astronomy; all which they comprehended in the following Latin verse:

Lingua, Tropus, Ratio, Numerus, Tonus, Angulus, Astra.

4. ARTIST, ? is more particularly used by ?.

ARTISTA, ? racelsus and other adepts, for chemist or alchemist:—We find frequent mention, in authors of this class, of Elias Artista, or Elias the artist, who is to come some time before the dissolution of the world, and restore and make perfect all arts and sciences, but especially the gold-making art; and usher in a truly golden age or millennium! The lower and meaner things in this sublime art, Paracelsus observes, God has permitted to be already discovered; but for the greater and more important matters, as the transmutation of other metals into gold, they are reserved to the coming of Elias the artist!

ARTIZOOS, [from ἄρτι, short, and ζωή, life,] is used by some ancient physicians for an infant short-lived, by reason of a difficult birth, whereby he was long detained in the passage from the womb.

ARTLEBOROUGH, a village in Northamptonshire, near Higham-Ferrers.

* ARTLESLY. *adv.* [from *artless*.] 1. In a artless manner; without skill. 2. Naturally; sincerely; without craft.—Nature and truth, though never so low or vulgar, are yet pleasing when properly and *artlessly* represented. *Pope.*

* ARTLESS. *adj.* [from *art* and *less*.] 1. Unskilful; wanting art; sometimes with the particle *of*:—

The high-shoo'd plowman, should he cry the land,
Artless of stars, and of the moving sand. *Dryden.*

2. Without fraud; as, an *artless* maid. 3. Contrived without skill; as an *artless* tale.

ARTOBRIGA, an ancient town of Vindelicia, now called *Altzburg*, in Bavaria, on the Danube below Ingolstadt; according to Aventinus; but Cluverius supposes it to be *Lebenau* on the Salzbach, below Lauffen, in the archbishopric of Salzburg.

(1.) ARTOCARPUS, [from ἄρτος, bread, and καρπός, fruit,] the BREAD FRUIT TREE: A genus of the monandria order, belonging to the monoecia class of plants. It has a cylindric amentum or catkin, which thickens gradually, and is covered with flowers; the male and female in a different amentum. In the male, the calyx is two-valved, and the corolla is wanting. In the female there is no calyx nor corolla; the styles are two, and the drupa is many celled.

(2.) ARTOCARPUS, DESCRIPTIONS OF THE. Though this tree has been mentioned by many voyagers, particularly by Dampier, by Rumphius, and by Lord Anson, yet very little notice seems to have been taken of it, till the return of Captain Wallis from the South Seas, and from that time by others, who have touched at Otaheite, and some countries in the East Indies. Captain Dampier relates, that in Guam, one of the Ladrone islands, "there is a certain fruit called the *bread-fruit*, growing on a tree as big as our large apple trees, with dark leaves. The fruit is round, and grows on the boughs like apples, of the bigness of a good penny loaf: when ripe, it turns yellow, soft, and sweet; but the natives take it green, and bake it in an oven till the rind is black; this they scrape off, and eat the heart, which

ich is ſoft and white, like the inſide of new-ed bread, having neither ſeed nor ſtone; but t is kept above 24 hours it is harſh. As this it is in ſeaſon 8 months in the year, the natives l upon no other ſort of bread during that time. y told us that all the Ladrone iſlands had plen-of it. I never heard of it in any other place." MPHIUS, after deſcribing the tree, obſervers, t "the fruit is ſhaped like a heart, and increaſ-o the ſize of a child's head. Its ſurface or t is thick, green, and covered every where h warts of a quadragonal or hexagonal figure, cut diamonds, but without points. The re flat and ſmooth theſe warts are, the fewer ds are contained in the fruit, and the greater he quantity of pith, and that of a more gluti-s nature. The internal part of the rind, or , conſiſts of a fleſhy ſubſtance, full of twiſted s, which have the appearance of fine wool; e adhere to, and in ſome meaſure form it.— fleſhy part of this fruit becomes ſofter to-ds the middle, where there is a ſmall cavity ned without any nuts or ſeeds, except in one ies, which has but a ſmall number, and this is not good unleſs it is baked, or prepared e other way: but if the outward rind be ta-off, and the fibrous fleſh dried and afterwards ed with meat as we do cabbage, it has then taſte of artichoke bottoms. The inhabitants Amboyna dreſs it in the liquor of cocoa-nuts, they prefer it roaſted on coals till the outward t or peel is burnt. They afterwards cut it in-pieces, and eat it with the milk of the cocoa-. Some people make fritters of it, or fry it in , and others, as the Sumatrians, dry the in-al ſoft part, and keep it to uſe inſtead of bread h other food. It affords a great deal of nou-ment, and is very ſatisfying, therefore proper hard working people; and being of a gentle ingent quality, is good for perſons of a laxa-habit of body. It is more nouriſhing boiled our manner with fat meat than roaſted on coals. e milky juice which diſtils from the trunk, led with the cocoa-nut oil, makes a very ſtrong d lime. This tree is to be found on the eaſtern ts of Sumatra, and in the Malay language is led *foccus* and *foccum capas*. It grows likewiſe out the town of Bantam in Java, and in Bale, and Madura, and is known there by the name *foccum*." In ANSON's voyage we are informed, hat the rima, or bread-fruit tree, is common all the Ladrone iſlands and ſome of the Philip-es. It is ſomewhat larger than our apple tree, l bears a broad dark-coloured leaf with five in-ntures on each ſide. The fruit hangs on boughs e apples; and is of the ſize of a penny loaf, h a thick tough rind, which when full ripe ns yellow. The natives gather it before it is te ripe, and bake it till the cruſt is pretty black; n they raſp it, and there remains a pretty loaf, h a tender yellow cruſt, and the crumb of it oft and ſweet as a new baked roll: it is with-any ſeeds or ſtones. This fruit the inhabi-ts enjoy for about 7 months; during which y never eat any other kind of bread: but they [redacted] it every day; for when it [redacted] and huſky, [redacted] the weſt

of England. There is, however, a remedy for this; which is cutting the loaf into ſlices when it is new, and drying it in the ſun, by which it is changed into the pleaſanteſt ruſk that can be eaten." Capt. COOK, in his voyage, obſerves, that this fruit not only ſerves as a ſubſtitute for bread among the inhabitants of Otaheite and the neighbouring iſlands, but alſo, variouſly dreſſed, compoſes the principal part of their food. It grows on a tree that is about the ſize of a middling oak; its leaves are frequently a foot and an half long, of an oblong ſhape, deeply ſituated like thoſe of the fig-tree, which they reſemble in colour and conſiſtence, and in the exſuding of a milky juice upon being broken. The fruit is about the ſize and ſhape of a new-born child's head; and the ſurface is reticulated, (ſee Plate XIV.) not much unlike a truffle; it is covered with a thin ſkin, and has a core about it as big as the handle of a ſmall knife. The eatable part lies between the ſkin and the core; it is as white as ſnow, and ſomewhat of the conſiſtence of new bread; it muſt be roaſted before it is eaten, being firſt divided into three or four parts; its taſte is inſipid, with a ſlight ſweetneſs ſomewhat reſembling that of the crumb of wheaten bread mixed with a Jeruſalem artichoke. This fruit is alſo cooked in a kind of oven, which renders it ſoft, and ſomething like a boiled potato; not quite ſo farinaceous as a good one, but more ſo than thoſe of the middling ſort. Of the bread-fruit they alſo make three diſhes, by putting either water or the milk of the cocoa nut to it, then beating it to a paſte with a ſtone peſtle, and afterwards mixing it with ripe plantains, bananas, or the ſour paſte which they call *mabie*.

(3.) ARTOCARPUS, METHOD OF PREPARING THE UNRIPE. The MAHIE, which is likewiſe made to ſerve as a ſuccedaneum for ripe bread-fruit before the ſeaſon is come on, is thus made: The fruit of the bread-tree is gathered juſt before it is perfectly ripe; and being laid in heaps, is cloſely covered with leaves: in this ſtate it undergoes a fermentation, and becomes diſagreeably ſweet; the core is then taken out entire, which is done by gently pulling out the ſtalk, and the reſt of the fruit is thrown into a hole which is dug for that purpoſe generally in the houſes, and neatly lined in the bottom and ſides with graſs: the whole is then covered with leaves and heavy ſtones laid upon them; in this ſtate it undergoes a ſecond fermentation, and becomes ſour, after which it will ſuffer no change for many months. It is taken out of the hole as it is wanted for uſe; and being made into balls, it is wrapped up in leaves and baked: after it is dreſſed, it will keep for five or ſix weeks. It is eaten both cold and hot; and the natives ſeldom make a meal without it, though to Europeans the taſte is as diſagreeable as that of a pickled olive generally is the firſt time it is eaten. The fruit itſelf is in ſeaſon 8 months in the year, and the mahie ſupplies the inhabitants during the other four.

(4.) ARTOCARPUS, SPECIES OF THE, &c. To procure this principal article of their food, coſts theſe happy people no trouble or labour, except climbing up a tree: the tree which produces it does not indeed grow ſpontaneouſly; but if a man plants ten of them in his life-time, which he may do

do in an hour, he will as completely fulfil his duty to his own and future generations, as the native of our leſs temperate climate can do, by ploughing in the cold of winter, and reaping in the ſummer's heat, as often as theſe ſeaſons return; even if, after he has procured bread for his preſent houſehold, he ſhould convert a ſurplus into money, and lay it up for his children. There are two ſpecies of this tree, viz.

1. ARTOCARPUS INCISUS, with gaſhed leaves.

2. ARTOCARPUS INTEGRIFOLIA, with entire leaves.

(5.) ARTOCARPUS, VARIETY OF THE. There is ſaid to be another diſtinction, into that which bears fruit with ſtones or ſeeds, and that in which the fruit has none. The parts of fructification of that tree which bears the fruit without ſtones are defective. The amentum, or catkin, which contains the male parts, never expands. The ſtyli, or female parts of the fruit, are likewiſe deficient: From which it follows, that there can be no ſtones or ſeeds, and therefore this tree can only be propagated by ſuckers or layers; although it is abundantly evident, that it muſt originally have proceeded from the ſeed-bearing bread-fruit tree. Inſtances of this kind we ſometimes find in European fruit; ſuch as the barberry, and the Corinthian grape from Zant, commonly called currants, which can therefore be increaſed only by layers and cuttings. Dr Solander was aſſured by the oldeſt inhabitants of Otaheite and the adjoining iſlands, that they well remembered, there was formerly plenty of the ſeed bearing bread-fruit; but they had been neglected upon account of the preference given to the bread-fruit without ſeed, which they propagate by ſuckers.

ARTOIS, a ci-devant province of France, extremely fertile, and formerly one of the 17 provinces of the Netherlands. The name was derived from the Atrebates, the ancient inhabitants. Its greateſt length from N. to S. was about 24 leagues, and its breadth about 12, being bounded to the S. and W. by Picardy, to the E. by Hainault, and to the N. by Flanders. It is now included in the department of the Straits of Calais.

ARTOLICA, in ancient geography, a town of the Salaſſii, in Gallia Ciſpadana, at the foot of the Alps; now called TUILE, a hamlet at the foot of mount St Bernard the Leſs.

ARTOMELI, [from ἄρτος, *bread*, and μέλι, *honey*,] in ancient pharmacy, a kind of cataplaſm, prepared of bread and honey, applied chiefly to the *præcordia*.

ARTONNE, an ancient ſmall town of France, in the department of Cantal, ſeated on the Morges.

ARTOTYRISTS, ARTOTYRITÆ, or ARTOTYRITES, [from ἄρτος and τυρός, cheeſe,] a branch of the ancient Montaniſts, who firſt appeared in the 2d century, in Galatia. They uſed bread and cheeſe in the Euchariſt, or perhaps bread baked with cheeſe. Their reaſon was, that the firſt men offered to God not only the fruits of the earth, but of their flocks too.

ARTRO, a river in Merionethſhire.

ARTS. See ART, N° I. § 3—12.

To ARTUATE. *v. a.* To tear limb from limb.

ARTUOSE. *adj.* well ſet; ſtrong made. *Bailey.*

ARTYSTONA, the daughter of Cyrus the Great, and wife of Darius I.

ARUA, in ancient geography, a town of Bætica, of the reſort of the Conventus Hiſpalenſis, now *Alcela*, a citadel of Andaluſia, on the Bætis, or Guadalquiver, 7 leagues above Seville.

ARVAD, or ARADUS, an ancient city of Phœnicia, built on a ſmall iſland, S. of Tyre, about 3 miles from the Continent. It was formerly famous for commerce and riches, and commonly ſhared the fate of Tyre. It is now called RUWADDE, and belongs to the Turks. It is quite ruinous, having only an old fort and a few cannon to defend it; but the height of the iſland gives it a good appearance from a diſtance.

ARVADITES, the ancient inhabitants of Arvad. They were the deſcendants of Canaan, and peopled it ſoon after the flood. In Ezekiel's time they were employed as mariners in the Tyrian fleet and guards on their walls. Ezek. xxvii. 8, 11.

ARVAL. See ARVIL.

ARVALES FRATRES, in Roman antiquity, a college of 12 prieſts, inſtituted by Romulus, and choſen out of the moſt noble families, himſelf being one of the body: they aſſiſted in the ſacrifices of the ambervalia annually offered to Ceres and Bacchus, for the proſperity of the fruits of the earth; when they wore on their heads crowns made of ears of corn.—The original of this inſtitution was as follows: Acca Laurentia, Romulus's nurſe, was accuſtomed once a-year to make a ſolemn ſacrifice for a bleſſing on the fields, her 12 ſons always aſſiſting her in the ſolemnity; but at laſt loſing one of her ſons, Romulus offered himſelf to ſupply his place, and gave this ſmall ſociety the name of *Arvales fratres*. This order was in great repute at Rome; they held the dignity for life, and never loſt it upon account of impriſonment, baniſhment, or any other accident.

ARVANS, ST, a village of Monmouthſhire, a little N. of Chepſtow, ſeated on the river Chepſtow.

ARUBA, a ſmall iſland on the coaſt of Terra Firma, ſubject to the Dutch, and ſituated in Lon. 69. 39. W. Lat. 12. 30. N.

ARUCH. See BARBAROSSA.

(1.) ARUCI NOVUM, in ancient geography, a town of the Celtici, N. of Luſitania, now ſuppoſed to be MOURA, a ſmall city of Portugal, near the confluence of the Ardila and Guadalquiver.

(2.) ARUCI VETUS, a ſmall city of the Turdetani, in Bætica, now called *Aroche*, a hamlet of Andaluſia, on the confines of Portugal and Eſtremadura, on the river Gama, 7 leagues E. of Aruci Novum.

ARUCIA, in ancient geography, a town of Illyria, in the inland parts of Liburnia, now called BREGNA, according to ſome; but OTTOSCHATZ, according to others; a citadel on Moriachia.

ARUCITANUS, a mountain near Aruci Vetus, now called *Sierra de Aroche*.

ARUE, a river of France in the department of Mont Blanc.

(1.) ARVERNI, a brave and ancient people; and one of the moſt powerful nations of Gaul, claimed affinity with the Romans, as deſcendants from Antenor; and after their conqueſts by the Romans, their ancient liberty was preſerved to them on account of their bravery.

(2.) ARVERNI,

) ARVERNI, an appellation early uſed for the tal of the Arverni, according to the cuſtom of latter ages of naming towns from the people; as formerly called *Nemoſſus*. Above 1000 s ago the town was called *Clarus Mons*, from tuation; it is now called CLERMONT. Lon. . E. Lat. 45. 42. N.

RVERT, 1. an iſland of France, in the de- ment of Lower Charente, ſituated S. of the th of the Soder, and E. of that of Marenne: town in the iſland.

.) ARVIL, or ARVAL, a funeral.

..) ARVIL BREAD, loaves diſtributed to the at funerals.

.) ARVIL SUPPER, a feaſt or entertainment at funerals, in the north part of England.

RVIRAGUS, the ſon of Cunobelin, an an- British king, who flouriſhed in the time of dius and Domitian. He ſucceeded his bro- A. D. 44. and gained a complete victory o- Claudius: but being ſoon after beſieged in the of Wincheſter, he made a treaty with the Ro- s, and married the emperor's daughter Ge- . This monarch condemned the ancient laws, ed new ones, and liberally rewarded perſons erit. He died A. D. 74.

'.) ARUM, a town of Lancaſhire, near Hornby.

'I. 1.) ARUM, WAKEROBIN, or CUCKOW-PINT: otany, a genus of the polyandria order, be- ing to the gynandria claſs of plants; and in natural method ranking under the 2d order, *ritæ*. The ſpatha is monophyllous, and cowl- ed; the ſpadix is naked above, female below, ſtamen'd in the middle.—There are 22 ſpecies, vhich the moſt remarkable are the following:

. ARUM ARBORESCENS, or dumb cane, is a ve of the ſugar iſlands and warm parts of A- ica, where it grows chiefly on low grounds. the parts of it abound with an acrid juice; ſo if a leaf or part of the ſtalk is broken and ap- d to the tip of the tongue, it occaſions a very nful ſenſation and a great defluxion of ſaliva. e ſtalks of this plant are ſometimes applied to mouths of the negroes by way of puniſhment.

. ARUM ARISARUM, as well as the ARUM BOSCIDIUM and ARUM TENUIFOLIUM, have ally been ſeparated from this genus, and diſ- guiſhed by the general name of *ariſarum*, or *r's cowl*, on account of the reſemblance of ir flowers to the ſhape of the cowls worn by ers. The flowers appear in April.

3. ARUM COLOCASIA, as well as the ARUM VARICATUM, ESCULENTUM, PEREGRINUM, SAGITTIFOLIUM, have all mild roots, which e eaten by the inhabitants of the hot countries, ere they grow naturally; and ſome of them e cultivated by the inhabitants of the ſugar co- nies, where their roots are conſtantly eaten; d even the leaves of ſome of them, particularly oſe of the eſculentum, which they call *Indian ale*: and which, in thoſe countries where many the eſculent vegetables of England are with ifficulty produced, prove a good ſuccedaneum.

4. ARUM DIVARICATUM has ſpear-ſhaped leaves. ee N° 3.

5. ARUM DRACUNCULUS, or the common dra- ons, grows naturally in moſt of the ſouthern arts of Europe. It has a ſtraight ſtalk 3 or 4 feet high, which is ſpotted like the belly of a ſnake: at the top it is ſpread out into leaves, which are cut into ſeveral narrow ſegments almoſt to the bottom, and are ſpread open like a hand: at the top of the ſtalk the flower is produced, which is in ſhape like the common arum, having a long ſpatha of a dark purple colour, ſtanding erect, with a large piſtil of the ſame colour; ſo that when it is in flower it makes no unpleaſing appearance; but the flower hath ſo ſtrong a ſcent of carrion, that few people can endure it, for which reaſon it hath been baniſhed moſt gardens.

6. ARUM ESCULENTUM, the eatable arum. See N° 3.

7. ARUM ITALICUM, a native of Italy, Spain, and Portugal. The leaves riſe a foot and an half high, terminating in a point; they are very large, and finely veined with white, interſperſed with black ſpots, which, together with the fine ſhining green, make a pretty variety. The flowers grow near a foot high; and have very long upright ſpathas, which are of a pale green. They appear in the end of April or beginning of May.

8. ARUM MACULATUM, or common wakerobin, grows naturally in woods and on ſhady banks in moſt parts of Britain. The leaves are halberd-ſhaped, very entire, and ſpotted; the berries numerous, growing in a naked cluſter. The flowers appear in April; and their wonderful ſtructure hath given riſe to many diſputes among the botaniſts. The receptacle is long, in the ſhape of a club, with the ſeed-buds ſurrounding its baſe. The chives are fixed to the receptacle amongſt the ſeed-buds, ſo that there is no occaſion for the tips to be ſupported upon threads, and therefore they have none; but they are fixed to the fruit-ſtalk, and placed between two rows of tendrils: the point in diſpute is, what is the uſe of thoſe tendrils?

9. ARUM PEREGRINUM, or elder. See N° 3.

10. ARUM PROBOSCIDIUM. See N° 2.

11. ARUM SAGITTIFOLIUM, or the greateſt Egyptian Arum. See N° 3.

12. ARUM TENUIFOLIUM. See N° 3.

13 ARUM, TRILOBATUM, or ARUM OF CEYLON, is a native of that iſland and ſome other parts of India; and cannot bear cold. It is a low plant; the flower riſes immediately from the root, ſtanding on a very ſhort footſtalk: the ſpatha is long, erect, and of a fine ſcarlet colour, as is alſo the piſtil.

(2.) ARUM, CULTURE OF THE. All the ſpecies of this plant are hardy, except the trilobatum and the arboreſcens. The former muſt be kept conſtantly in a ſtove, and the latter in a moderate hot-bed. The arboreſcens is propagated by cutting off the ſtalks into lengths of three or four joints, which muſt be left to dry ſix weeks or two months; for if the wounded part is not perfectly healed over before the cuttings are planted, they will rot and decay. They are then to be planted in ſmall pots filled with light ſandy earth, and plunged in a moderate hot bed or tan, obſerving to let them have little water till they have taken good root.

(3.) ARUM, MEDICINAL USES OF THE. The roots of the maculatum and dracunculus are uſed in medicine, and differ in nothing but that the latter

latter is ſomewhat ſtronger than the former. All the parts of the arum, particularly the root, have an extremely pungent, acrimonious taſte; if the root be but lightly chewed, it continues to burn and vellicate the tongue for ſome hours, occaſioning, at the ſame time a conſiderable thirſt: theſe ſymptoms are alleviated by butter, milk, or oily liquors. Dried and kept for ſome time, it loſes much of its acrimony, and becomes at length an almoſt inſipid farinaceous ſubſtance. This root is a powerful ſtimulant and attenuant. It is reckoned a medicine of great efficacy in ſome cachectic and chlorotic caſes, in weakneſs of the ſtomach occaſioned by a load of viſcid phlegm. Great benefit has been obtained from it in rheumatic pains, particularly thoſe of the fixed kind, and which were ſeated deep. In theſe caſes it may be given from 10 grains to a ſcruple of the freſh root twice or thrice a-day, made into a bolus or emulſion with unctuous and mucilaginous ſubſtances, which cover its pungency, and prevent its making any painful impreſſion on the tongue. It generally excites a ſlight tingling ſenſation through the whole habit, and when the patient is kept warm in bed, produces a copious ſweat. The arum was formerly an ingredient in an officinal preparation, the compound powder; but in that form its virtues are very precarious. Some recommended a tincture of it drawn with wine; but neither wine, water, nor ſpirits, extract its virtues.

(III.) ARUM, AFRICAN. See CALLA.

(IV.) ARUM, FLOATING. See ORONTIUM.

ARUN, a river in Suſſex.

ARUNCUS, GREATER MEADOW-SWEET, in botany, a genus of plants, called by Tournefort, and others, *barba capræ*; and by Linnæus *ſpiræa*. This plant has been ſuppoſed to be of the ſame genus with the *filipendula*; but, by the examination of the flowers, they appear to be extremely different.

ARNUDA, a town of Hiſpania Bætica, on the Annas, or Guadiana, now ſaid to be RONDA, in Granada, on the confines of Andaluſia. Lon. 5. 40. W. Lat. 36. 26. N.

(1.) ARUNDEL, a borough and market town in Suſſex, ſeated on the NW. ſide of the Arun, over which there is a bridge. It had a harbour, wherein a ſhip of 100 tons burthen might ride; but the ſea had ruined it ſo far, that in 1733, an act paſſed for repairing it, and for erecting new piers, locks, &c. The caſtle is ſeated on the eaſt of the Taine, and is reputed to be a mile in compaſs. It ſends two members to parliament; and is 55 miles SW. by S. of London, and 10 miles E. of Chicheſter. Arundel is the premier earldom in England, belonging to the illuſtrious family of Norfolk; and is the only title in England that goes along with the lands. Lon. 0. 25. W. Lat. 50. 45. N.

(2.) ARUNDEL OIL, in the materia medica. At Bombay, Gambroon, and Surat in the Eaſt Indies, there grows a tree which bears a nut incloſed in a rough huſk; reſembling the horſe cheſnut; and the kernel of the nut yields an oil by expreſſion, which is of a purgative nature. A tea ſpoonful of it is reckoned a doſe. The tree is called the *drundel tree* at Bombay, and its oil the *Arundel oil*. Mr Sinclair, one of the ſurgeons belonging to the royal regiment of artillery, who was formerly ſurgeon to an Eaſt India ſhip, gave Dr Monro of London a ſmall bottle full of this oil, which he ſaid was much uſed for the cure of the dyſentery in India, and that he had given it in four recent caſes of dyſentery with ſucceſs.—Dr Monro thinks it probable that this is the oil of the purging nuts mentioned in Dale's Pharmacologia, which are got from the tree called *Lignum Rhodium*, and the *palma Chriſti Indica*, of Tournefort.

(3.) ARUNDEL, Thomas, archbiſhop of Canterbury in the reigns of Richard II. Henry IV. and Henry V. He was the 2d ſon of Robert Earl of Arundel, and brother of Richard Earl of Arundel, who was beheaded. In 1375, at 22 years of age, from being archdeacon of Taunton he was raiſed to the biſhopric of Ely, in the reign of Edward III. He was a great benefactor to the church and palace of this ſee; among other donations he gave a curious table of maſſy gold, adorned with precious ſtones, which had been given to prince Edward by the king of Spain, and ſold by the ſaid to Biſhop Arundel. In 1386, he was appointed lord chancellor of England; in 1388, he was tranſlated to the archiepiſcopal ſee of York; and in 1396, to that of Canterbury, when he reſigned the chancellorſhip. This was the firſt inſtance of the tranſlation of an archbiſhop of York to the ſee of Canterbury. Scarcely was he ſeated in this ſee, when he had a conteſt with the University of Oxford about the right of viſitation. The affair was referred to king Richard, who determined it in favour of the archbiſhop. At his viſitation in London, he revived an old conſtitution, by which the inhabitants of the reſpective pariſhes were obliged to pay to their rector one halfpenny in the pound out of the rent of their houſes. In the 2d year of his tranſlation, a parliament was held at London, the commons, with the king's leave, impeached the archbiſhop, together with his brother the Earl of Arundel, and the Duke of Glouceſter, of high treaſon. The archbiſhop was ſentenced to be baniſhed, and within 40 days depart the kingdom on pain of death. He went firſt to France; and then to the court of Rome, where Pope Boniface IX. gave him a kind reception. About this time the Duke of Lancaſter (afterwards Henry IV. was in France, having been baniſhed by king Richard. The nobility and others, tired with the oppreſſions of Richard, invited the Duke to take the crown. This they did by queſt they drew up in a letter, and ſent it by faithful meſſengers to archbiſhop Arundel, deſiring him to be their advocate on this account with the Duke. The archbiſhop being a fellow-ſufferer, gladly accepted the office; and went with the meſſengers to the Duke at Paris, where they delivered the letters from the nobility and commons of England, and the archbiſhop ſupported them with the beſt arguments he could. The inviting offer, after ſome objections were eaſily obviated, the Duke [illegible] upon his acceſſion to the throne, had returned with him to England, [illegible] to his ſee. In the firſt year of [illegible] Arundel ſummoned a ſynod [illegible]

e next year the commons moved that the reve-
s of the church might be applied to the ſervice
he public: but Arundel oppoſed the motion
h ſuch vigour, that it was thrown aſide. In
8, Arundel began to exert himſelf againſt the
lards, or Wickliffites; and his zeal for ſup-
ſſing that ſect carried him to ſeveral unjuſtifi-
e ſeverities againſt the heads of it, particularly
inſt Sir John Oldcaſtle and Lord Cobham. He
procured a ſynodical conſtitution, which for-
e the tranſlation of the Scriptures into the vul-
tongue. He died at Canterbury, in 1413, of
inflammation in his throat, with which he was
ed whilſt he was pronouncing ſentence upon
d Cobham. The Lollards aſſerted this to be
udgment from God; and indeed Biſhop Gond-
ſpeaks in the ſame manner, ſaying, "He who
withheld from the people the word of God,
food of the ſoul, by the juſt judgment of God
his throat ſo cloſed, that he could not ſpeak
ngle word, nor ſwallow meat or drink, and
ſo ſtarved to death." He was buried in the
hedral church of Canterbury, under a monu-
nt erected by himſelf. To this church he was
onſiderable benefactor: for he built the lantern
er and a great part of the nave; gave a ring of
bells, called from him *Arundel's ring*; ſeveral
veſtments, a mitre enchaſed with jewels, a
er gilt croſier, and two golden chalices.

4.) ARUNDEL TREE. See ARUNDEL OIL.

5.) ARUNDELIAN MARBLES, OXFORD MARBLES, or PARIAN CHRONICLE, are ancient ſtones has been ſuppoſed,) whereon is inſcribed a onicle of the city of Athens, engraven in capi-letters in the iſland of Paros, one of the Cy-des, 264 years before Jeſus Chriſt. They take ir firſt name from Thomas Earl of Arundel, o procured them out of the Eaſt, or from ary his grandſon, who preſented them to the iverſity of Oxford. The Arundelian Marbles, heir perfect ſtate, contained a chronological ail of the principal events of Greece during a iod of 1318 years, beginning with Cecrops, be-e Chriſt 1582 years, and ending with the arch-hip of Diognetus, before Chriſt 264. But the onicle of the laſt 90 years is loſt; ſo that the t now remaining ends at the archonſhip of Di-mus, 354 years before the birth of Chriſt: and this fragment the inſcription is at preſent ſo ich corroded and effaced, that the ſenſe can y be diſcovered by very learned and induſtrious iquaries; or, more properly ſpeaking, ſup-ed by their conjectures. This chronicle, and ny other relics of antiquity, real or pretended, re purchaſed in Aſia Minor, in Greece, or in iſlands of the Archipelago, by Mr William tty, who in the year 1624, was ſent by Thomas rl of Arundel for the purpoſe of making ſuch lections for him in the Eaſt. They were ought into England about the beginning of the ar 1627, and placed in the gardens belonging Arundel houſe in London. Soon after their ar-al they excited a general curioſity, and were wed by many inquiſitive and learned men; a-ng others by Sir Robert Cotton, who prevailed on Selden to employ his abilities in explaining Greek inſcriptions. Selden and two of his ends, Patrick Young, or, as he ſtyled himſelf in Latin, *Patricius Junius*, and Richard James, immediately commenced their operations, by cleaning and examining the marble containing the Smyrnean and Magneſian league, and afterwards proceeded to the Parian chronicle.—The following year Selden publiſhed a ſmall volume in quarto, including about 39 inſcriptions copied from the marbles. In the turbulent reign of Charles I. and the ſubſequent uſurpation, Arundel-houſe was often deſerted by the illuſtrious owners; and, in their abſence, ſome of the marbles were defaced and broken, and others either ſtolen or uſed for the ordinary purpoſes of architecture. The chronological marble, in particular, was unfortunately broken and defaced. The upper part containing 31 epochas, ſaid to have been worked up in repairing a chimney in Arundel-houſe. In 1667, the Hon. Henry Howard, afterwards Duke of Norfolk, the grandſon of the firſt collector, preſented theſe ſuppoſed remains of antiquity to the univerſity of Oxford. Selden's work becoming very ſcarce, Biſhop Fell engaged Mr Prideaux to publiſh a new edition of the inſcriptions, which was printed at Oxford in 1676. In 1732 Mr Maittaire obliged the public with a more comprehenſive view of the marbles than either of his predeceſſors. Laſtly, Dr Chandler publiſhed a new and improved copy of the marbles in 1763, in which he corrected the miſtakes of the former editors; and in ſome of the inſcriptions, particularly that of the Parian chronicle, ſupplied the *lacunæ* by many ingenious conjectures.

(2.) ARUNDELIAN MARBLES, AUTHENTICITY OF THE, DOUBTED. The Arundelian marbles have generally been regarded as a curious monument of antiquity. They were, however, diſcovered in ſome inſtances to be inconſiſtent with the moſt authentic hiſtorical accounts; Sir Iſaac Newton and ſeveral other modern philoſophers paid little or no regard to them; and of late their authenticity has been ſeverely queſtioned in an expreſs diſſertation upon the ſubject, entitled, *The Parian Chronicle*. In this diſſertation much ingenuity as well as judgment and a great extent of ancient learning are diſplayed. His doubts, the author obſerves, ariſe from the following conſiderations:—I. "The characters have no certain or unequivocal marks of antiquity." The Π and Ζ, which frequently occur in the form which is ſuppoſed to be the moſt ancient (viz. the perpendicular line of the Π on the right hand, only half as long as that on the left, and the Ζ in the form of a proſtrate Ξ,) are ſo well known, that any modern fabricator of a Greek inſcription, which he intends to impoſe upon the world as a relic of antiquity, would moſt probably uſe them in preference to the more common and ordinary forms. But the letters in the Parian chronicle have no appearance of antiquity, except this very equivocal one. They do not in the leaſt reſemble the Sigean, the Nemean, or the Delian inſcriptions, which are ſuppoſed to be of a more ancient date. They differ, in many reſpect, from the letters on the Marmor Sandvicenſe, which, according to the learned editor of that inſcription, was engraven in the year before Chriſt 374. They bear no ſort of reſemblance to the characters on the Farneſian pillars, to thoſe of the

Alexandrian manuſcript, or others of a later date. They ſeem, continues our author, to reſemble, perhaps more than any other, the letters of the alphabet, taken by Montfacon, from the Marmor Cyzicenum at Venice. They are plain and ſimple in their form, and ſuch as an ordinary ſtone cutter of the preſent age would probably make, if he were employed to engrave a Greek inſcription, according to the alphabet now in uſe. The ſmall letters, intermixed among the larger, have, in the opinion of our author, an air of affectation and artifice, rather than genuine antiquity; and he is perſuaded, that the antiquity of an inſcription can never be proved by the mere form of the letters, becauſe the moſt ancient characters may be as eaſily counterfeited as thoſe which compoſe our preſent alphabets. That the learned reader may form a competent idea of the characters in the Parian chronicle, the author has compared them with thoſe of other inſcriptions, and given what is uſually termed a *fac ſimile*. In regard to ſeveral *archaiſms*, as they are called, in this chronicle, and which our author ſpecifies, he contends, that no concluſion can be drawn, from them in favour of its antiquity. What reaſon could there be, he aſks, for introducing theſe into the Parian chronicle? We do not uſually find them in Greek writers of the ſame age, or even in thoſe of the moſt early date. The reign of Ptolemy Philadelphus, with the 21ſt year of which the date of the chronicle coincides, was not an age of rude antiquity, with reſpect to the Greek language; being only 130 years after the time of Xenophon and Plato, when the Greek was ſpoken and written in its utmoſt purity and elegance: and we can ſcarcely ſuppoſe, that even a ſtone cutter, in that refined age, would have been permitted to diſgrace a ſuperb and learned monument, with ſuch barbariſms as occur in the chronicle. The archaiſms, however, he remarks, are not uniformly obſerved in this inſcription. He adduces ſix inſtances of deviation; and adds, he is almoſt tempted to ſuſpect, that ιμ Παρω, ιμ Μαραθωνι, and other pretended archaiſms, are owing to a mere affectation of antiquity, or to a corrupted dialect and pronunciation in later ages.—Theſe archaiſms, our author acknowledges, appear on other marbles: but he thinks, that, for that very reaſon, they would naturally be adopted by the fabricator of a ſuppoſitious inſcription; and the authenticity of thoſe inſcriptions in which they appear muſt be eſtabliſhed, before they can be urged in oppoſition to the preſent argument. II. "It is not probable that the chronicle was engraved for *private uſe*." Our author thinks it an impoſſible ſuppoſition that ſuch an expenſive and cumberſome work could have been executed by a private citizen, either for his own amuſement, or for the benefit of his fellow citizens. In the firſt place, a long inſcription could not be engraved in marble, without ſuch an expence as few learned Greeks were able to afford. Or, if its author, by an uncommon felicity, was able to erect ſuch a literary monument, the ſcheme would have been uſeleſs and imprudent; as all the contents of the inſcription might have been publiſhed more commodiouſly and effectually by the common mode of writing in uſe at that time. A variety of arguments is adduced, illuſtrating the ſuperiority of a manuſcript, to ſuch an inſcription as the chronicle, in a number of reſpects; and enforcing the improbability of its having ever been executed, either for public or private uſe. Much evidence from ancient hiſtory is likewiſe produced in ſupport of the aſſertion, that the common mode of writing, in the reign of Ptolemy Philadelphus, was not on ſtones. It is not, however, neceſſary to prove, by the teſtimony of ancient authors, that books were written on parchment, or paper made of the Egyptian Papyrus, or any ſuch materials, before the date of the Parian chronicle. This is ſufficiently evinced by the very writings of Moſes, David, Solomon, and the Jewiſh prophets; the works of Homer, Heſiod, Anacreon, Pindar, Æſchylus, Sophocles, Euripides, Herodotus, Hippocrates, Ariſtophanes, Thucydides, Xenophon, Plato, Demoſthenes Ariſtotle, &c. and it is inconteſtibly proved by the libraries which were collected in preceding ages, or about that time; ſuch as thoſe of Polycrates in Samos, Piſiſtratus and Euclides at Athens, Nicocrates in Cyprus, Euripides the poet, Ariſtotle the philoſopher, Clearchus at Heraclea Pontica, and the moſt extenſive and magnificent library of Ptolemy Philadelphus in Egypt, founded in or before the year 284, which in his time is ſaid to have contained 100,000 volumes, and to have been enlarged by his ſucceſſors to the amount of almoſt 700,000. Not long afterwards a library was founded at Pergamus by Attalus and Eumenes, which, according to Plutarch, contained 200,000. Theſe are clear and deciſive proofs, that the common mode of writing in the time of Ptolemy Philadelphus was not on ſtones. III. "The chronicle does not appear to have been engraved by *public authority*." 1. The firſt argument in ſupport of this opinion is, that inſcriptions of that kind uſually begin with a particular form: as, Η ΒΟΥΛΗ ΚΑΙ Ο ΔΗΜΟΣ, "The ſenate and the people;" or thus, ΕΔΟΞΕΝ ΤΗι ΒΟΥΛΗΙ ΚΑΙ ΤΟΙ ΔΗΜΩΙ, "It pleaſed the ſenate and the people, &c." But the Parian chronicle begins in the manner of a private man, ſpeaking of his own performance in the firſt perſon ſingular. This argument, our author remarks, cannot be much affected by obſerving, that the beginning of the inſcription is obliterated; for it is neceſſarily implied by the words now remaining. 2. The facts and dates, which are mentioned in this chronicle, do not appear to have been extracted from any public records, or calculated to anſwer the purpoſe of authentic documents; as many eminent princes and magiſtrates are paſſed over without notice; in ſeveral inſtances, the tranſactions of whole centuries are omitted; and the facts chiefly ſpecified, are not matters of general or national importance. 3. The Parian inſcription is ſuch a one as we can hardly ſuppoſe the magiſtrates or the people of Paros would have ordered to be engraved. Stately ſepulchres, pillars, triumphal arches, and the like, were erected to perpetuate the glory of eminent men. The remembrance of events in which nations were intereſted, the ſucceſſion of princes, &c. were preſerved in the ſame manner. Leagues, decrees and laws, were likewiſe engraved on marble or braſs.

brass, and fixed to a pillar, the walls of a temple or other public buildings; because such inscriptions were designed for the inspection of the people, as they essentially concerned their conduct, their property, their liberty, or their lives. But, our author asks, for whom could the chronicle of Paros be intended? It contains no encomiums on any of the patriots, the heroes, or the demigods of the country, no decrees of the magistrates, no public records, no laws of state.—On the contrary, it is a work of mere speculation and learning, in which the inhabitants of that island, especially the common people, had not the least interest or concern. These words at the beginning, ἀρξάμενος ἀπὸ Πάρου, would naturally lead us to suppose, that the inscription related to Paros. And, if so, it would have been natural for the author to have mentioned some of the most important occurrences in the history of that island. But, says this acute and learned critic, what scheme does our chronologer pursue on this occasion? Does he record the events and revolutions of his own country? Does he mention any of the battles, sieges, and treaties of the Parians? any of their public institutions? any of their poets, patriots, or warriors? Does he mention Archilochus, who was honoured by his countrymen, and distinguished as a poet in a general assembly of the Greeks? Not a syllable on any of these subjects! On the contrary, he rambles from place to place, and records the transactions of Athens, Corinth, Macedon, Lydia, Crete, Cyprus, Sicily, Persia, and other foreign countries with which Paros had no connection. In this view, the inscription seems to have been as unnecessary in Paros, as a marble monument would be in this country, recording the antiquities of France or Spain, or one in Jamaica recording the revolutions of England. But upon supposition, that the inscription is a forgery, it is easy to account for this extraordinary circumstance. A few chronological occurrences in the ancient history of Paros would not have been so interesting to the generality of readers, or so valuable in the estimation of every lover of antiquities, or, in short, so profitable to the compiler, as a general system of Grecian chronology. IV. "The Greek and Roman writers, for a long time after the date of this work, complain that they had no chronological account of the affairs of ancient Greece." This position is confirmed by the testimony of Julius Africanus, Justin Martyr, Plutarch, Josephus, Varro, Diodorus Siculus, and others; and the following series of interrogatories is subjoined: Thucydides, I know, lived 140 years before the chronicle is said to have been written; but if Thucydides, as well as other writers, complained that there was nothing but uncertainty in the earlier period of Grecian history, from whence can we suppose the author of this inscription collected such a clear, determinate, and comprehensive system of chronology? if he had any sources of information, which were unknown to succeeding writers, how happens it, that they should all of them overlook this most considerable, most exact, most creditable author? Why did they omit this ancient account of their early ages? Why did they not copy his most memorable epochas? Why did they not produce his authority? or, at least why did they not mention his opinion? Surely nothing, to all appearance, could more be elaborate, more important, or of higher authority, than a chronological table, which was thought worthy of being engraved upon tables of marble.—V. "The chronicle is not once mentioned by any writer of antiquity." This indeed appears a strong argument against its authenticity. Apollodorus, an Athenian, the disciple of Aristarchus the grammarian, and Panætius the philosopher, wrote a genealogical historical work on the early ages of Greece; but, though composed 120 years after the date of the Parian chronicle, it does not contain the smallest traces of a systematical chronology. It is remarkable too that the chronicle of Apollodorus is quoted by Diodorus Siculus, Strabo, Plutarch, A. Gellius, Lucian, and many other writers of antiquity; while the Parian chronicle, which comprehends a more extensive period, is entirely unnoticed. It contains, however, such wonderful discoveries in ancient history, that if it had existed 264 years before the Christian æra, it must have excited a general attention, and been referred to as an authority by writers of succeeding times. But we do not find, in any author of antiquity, either poet or historian, geographer or chronologer, mythologist or scholiast, the most distant allusion to the Parian chronicle; though it was such a common practice among the ancients to mention the works of his predecessors, that in many books we find references and allusions to 3, 4, 5, 6, or 700 different authors of every denomination. VI. "Some of the facts mentioned in the chronicle seem to have been taken from writers of a later date." Our inquirer collates several passages in the Parian chronicle with parallel passages in Greeks authors, to evince that there is, in the former, an appearance of imitation, or a stronger resemblance than such as may be supposed to arise from accident; there are likewise some improbabilities attending the account of Deucalion as related in the Parian chronicle; and that the names of six, and, if the lacunæ are properly supplied, the names of 12 cities appear to have been engraved on the marble, exactly as we find them in Ælian's Various History. But there is not, our author observes, any imaginable reason for this particular arrangment. It does not correspond with the time of their foundation, with their situation in Ionia, with their relative importance, or with the order with which they are placed by other eminent historians. The argument by which our author endeavours to prove that the Parian chronicle has, in this instance, copied Ælian's Various History, seems decisive of the fact. He observes, that six names may be transposed 720 different ways; and that 12 names admit of 479,001,600 different transpositions. Supposing then, that there is no particular reason for one arrangement rather than another, it will follow, that the chance of two authors placing them in the same order, is, in the former case, as 1 to 720; and in the later, as 1 to 479,001,600. It is therefore, says he, utterly improbable, that these names would have been placed in this order on the marble, if the author of the inscription had not transcribed them from the historian. It may indeed be urged,

with regard to this ſimilarity of arrangement in the Parian chronicle and Ælian's Various Hiſtory, that the inference might be very inverſe of that which is ſpecified by our author. But that Ælian ſhould have ſeen the Parian chronicle, without once mentioning it; or that he ſhould have exactly copied a liſt of towns, arranged neither according to chronological nor topographical order; is indeed a ſuppoſition equally improbable with the other. VII. "Parachoniſms appear in ſome of the epochas, which we can ſcarcely ſuppoſe a Greek chronologer in the 129th Olympiad would be liable to commit." After ſpecifying theſe, our inquirer aſks, Would a writer of reputation and learning, in one of the moſt poliſhed and enlightened æras of ancient Greece, commit ſuch miſtakes, in oppoſition to the moſt poſitive atteſtations of the moſt accurate hiſtorians, in events of public notoriety? Would a private citizen or a magiſtrate of Paros, order a crude and inaccurate ſeries of epochas to be engraved, at a great expence, and tranſmitted to poſterity on a marble monument? It is hardly probable. VIII. "The hiſtory of the diſcovery of the Parian chronicle is obſcure and unſatisfactory." Our author obſerves, that it is attended with ſome ſuſpicious circumſtances and without any of thoſe clear and unequivocal evidences, which always diſcriminate truth from falſehood. There are no data in the inſcription by which to diſcover the place where the marble was erected. The place likewiſe where it was found is not aſcertained; though the generality of writers who have had only occaſion to mention it have ſuppoſed that it was found in the iſland of Paros. If it was erected at Smyrna, as ſome imagine, our author aſks, for what purpoſe does the writer mention Aſtyanax the archon of Paros, and not one circumſtance relative to Smyrna? If, he adds, it was erected at Paros, why does he not mention more archons than one? Or how ſhall we account for his profound ſilence with reſpect to all the events and revolutions which muſt have happened in that iſland, and have been infinitely more intereſting to the natives than the tranſactions of any foreign country? The train of circumſtances by which the Parian chronicle came into the poſſeſſion of Mr Petty, whom Lord Arundel had ſent into the Eaſt for the purpoſe of collecting antiquities, as well as the ſubſequent conduct of Peireſc its former owner, affords our author a ſtrong preſumption, that "the inſcription was actually fabricated, with a view of obtaining for it a high price, upon the pretence that it was a relic of great antiquity. It is certain, that there is ſomething myſterious in the conduct of the firſt oſtenſible proprietors. Theſe marbles had been totally unknown, or unnoticed, for almoſt 1900 years, and at laſt they are dug out of the ground—no body can tell us when or where!" IX. "The literary world has been frequently impoſed upon by ſpurious books and inſcriptions; and therefore we ſhould be extremely cautious with regard to what we receive under the venerable name of antiquity." This propoſition is illuſtrated by a great variety of examples, and very properly expoſes the forgeries which have diſgraced the republic of letters in different ages; and although one of the more recent ones cited, namely, Oſſian's poems, be a point very far indeed from being eſtabliſhed, yet that deceptions of this kind have been practiſed is an unqueſtionable fact. In endeavouring, towards the end of his diſſertation, to inveſtigate the time of the ſuppoſed forgery, he obſerves, that the 16th century, and the prior part of the 17th century, produced a multitude of grammarians, critics, and commentators, deeply verſed in Grecian literature, and amply qualified for the compilation of ſuch a chronological ſyſtem as that of the Arundelian marbles. Above all, the ſciences of chronology was particularly ſtudied and inveſtigated about that time: "Nunc fervet chronologia," ſays Scaliger in the year 1605, "omnes hoc ferrum excalfaciunt." Caſaubon treats thoſe perſons with contempt who were unacquainted with the improvements which had been made in that department of learning after the revival of letters. Innumerable ſyſtems of chronology had been publiſhed before the year 1615; from which it was eaſy to extract a ſeries of memorable events, and give the compilation a Grecian dreſs. "The avidity," ſays our author, "with which all relics of antiquity were then collected, and the high price at which they were purchaſed, were ſufficient inducements to any one whoſe avarice or whoſe neceſſity was ſtronger than his integrity, to engrave his labours on marble and tranſmit them to Smyrna, as a commodious emporium for ſuch rarities." The preciſe period of the fabrication, however, muſt ſtill be reckoned apocryphal and uncertain. The ſum of 50 guineas which Peireſc gave to the ſuppoſed fabricator, was inadequate to ſuch a laborious and extenſive work. Upon the whole, perhaps, it would be too haſty to pronounce deciſively that this famous chronicle ſo long reſpected, is an impoſition upon the public. It may, however, be ſafely affirmed that the ſuſpicions againſt it are extremely ſtrong, and the objections already cited of a nature very difficult to be removed. No attempts have yet been made with this view.

ARUNDIFEROUS, *adj.* bearing reeds. *Bailey.*

* ARUNDINACEOUS. *adj.* [*arundinaceus*, Lat.] Of or like reeds. *Dict.*

* ARUNDINEOUS. *adj.* [*arundineus*, Lat.] Abounding with reeds.

ARUNDINOSE. See the laſt article.

(I. 1.) ARUNDO, in botany, the REED: A genus of the digynia order, belonging to the triandria claſs of plants; and in the natural method ranking under the 4th order, Gramina. The calyx conſiſts of two valves, and the floſcules are thick and downy. There are 6 ſpecies, viz.

1. ARUNDO ARBOREA, has a tree like ſtalk, with narrow leaves, and in all other reſpects reſembles the BAMBOS. See N° 2.

2. ARUNDO BAMBOS, or the bamboo, is a native of the Eaſt Indies and ſome parts of America; where it frequently attains the height of 60 feet. See BAMBOO. The main root is long, thick, jointed, ſpreads horizontally, and ſends out many cylindrical woody fibres of a whitiſh colour, and many feet long. From the joints of the main root ſpring ſeveral round jointed ſtalks to a prodigious height, and at about 10 or 12 feet from the ground ſend out at their joints ſeveral ſtalks joined together at their baſe: theſe run up in the ſame

e manner as thoſe they ſhoot out from. If any
heſe be planted with a piece of the firſt ſtalk ad-
ng to them, they will perpetuate their ſpecies
y are armed at their joints with one or two
p rigid ſpines, and furniſhed with oblong oval
es, eight or nine inches long, ſeated on ſhort
ſtalks. The flowers are produced in large
icles from the joints of the ſtalks, placed three
parcel cloſe to their receptacles: they reſemble
e of the common reed and are ſucceeded by
s of the ſame form ſurrounded with down.
young ſhoots are covered with a dark green
; theſe when very tender are put in vinegar,
garlic, and the pods of capſicum, and thus
d a pickle, which is eſteemed a valuable con-
ent in the Indies, and is ſaid greatly to pro-
e the appetite and aſſiſt digeſtion. See ACHIAR.
ſtalks in their young ſtate are almoſt ſolid,
contain a milky juice; this is of a ſweet na-
; and as the ſtalks advance in age, they be-
e hollow except at the joints, where they are
ped by a woody membrane, upon which this
or lodges, and concretes into a ſubſtance call-
ABAXIR, or ſugar of *Mombu*, which was held
ich eſteem by the ancients, in ſome particular
rders, that it was equal in value to its weight
ilver. The old ſtalks grow to 5 or 6 inches
meter, and are then of a ſhining yellow colour,
are ſo hard and durable that they are uſed in
dings, and for making all ſorts of houſehold
iture. Theſe, when bored through the mem-
es at their joints, are converted into water
s. Theſe ſerve alſo to make the ſticks with
ch the ſlaves or other perſons carry thoſe ſort
itters which are called *palanquins*, and are ſo
mon and convenient in all the Eaſt. The
ller ſtalks are uſed for walking ſticks. The
bitants of Otaheite make flutes of them, about
ot long, with two holes only, which they ſtop
the firſt finger of the left hand and the mid-
one of the right, and they blow through their
rils.

ARUNDO DEBAX, or manured reed, is a na-
of warm countries, but will bear the cold of
moderate winters in the open air. It dies to
ſurface in autumn, but appears again in the
ng 10 or 12 feet high in one ſummer. The
s of this are brought from Spain and Portu-
and are uſed by the weavers, as alſo for ma-
; fiſhing rods.

ARUNDO ORIENTALIS is what the Turks uſe
riting pens: it grows in a valley near mount
ee, as alſo on the banks of the river Jordan.
e of theſe plants are found in Britain.

ARUNDO PHRAGMITIS, or the common
ſh-reed, grows by the ſides of our rivers, and
anding waters.

ARUNDO VERSICOLOR, the Indian variegated
, is ſuppoſed to be a variety of the Debax,
ring from it only in having variegated leaves.

2.) ARUNDO, CULTURE OF THE. As all theſe
its grow naturally in low marſhy lands, they
t be ſupplied with plenty of water. The De-
requires little care; the Verſicolor is more de-
te, and requires to be kept in pots. The Ar-
s, the Bamboo and the Orientalis muſt be pre-
ed in ſtoves, planted in tubs filled with rich
h, and plentifully ſupplied with water. When
the tubs decay, they may be ſuffered to grow into
the tan, which will encourage them to grow to a
larger ſize: but care muſt be taken, when the bed
is refreſhed with new tan, to leave a ſufficient
quantity of old tan about the roots of the plants;
for if they are too much bared, and the new tan
laid near them, it will ſcorch their roots, ſo that
the plants may be deſtroyed.

(II.) ARUNDO INDICA, in the materia medica,
the name of the *arundo ſanguinem draconis manans*
of Moriſon. This is the plant from the fruit of
which, by maceration in warm water, they get a
kind of dragon's blood, which makes the fine red
of the Indian varniſhes.

(III.) ARUNDO SACCHARIFERA, the *Sugar cane*.
See SACCHARUM.

ARUNS TARQUINIUS, the ſon of Tarquin II.
the laſt king of Rome, who meeting Brutus in the
firſt battle, after the baniſhment of the royal fa-
mily, they mutually killed each other.

(1.) ARURA, in antiquity. See AROURA.

(2.) ARURA, in middle age writers, a field
ploughed and ſowed. Some writers alſo uſe the
word to ſignify the work of a day at plough.

ARUSINI CAMPI, } plains in Lucania, fa-
ARUSIAN FIELDS, } mous for the laſt battle
fought between the Romans and Pyrrhus. That
prince being at Tarentum, and hearing that the
two new conſuls Curius Dentatus and Cornelius
Lentulus had divided their forces, the one includ-
ing Lucania and the other Samnium; he likewiſe
divided a choſen detachment of his army into two
bodies, marching with his Epirots againſt Denta-
tus, in hopes of ſurpriſing him in his camp near
Beneventum. But the conſul having notice of
his approach, marched out of his entrenchments
with a ſtrong detachment of legionaries to meet
him, repulſed his van guard, put many of the E-
pirots to the ſword, and took ſome of their ele-
phants. Curius, encouraged by this ſucceſs
marched into the Aruſian fields, and drew up his
army in a plain, which was wide enough for his
troops, but too narrow for the Epirot phalanx to
act with its full effect. But the king's eagerneſs
to try his ſtrength and ſkill with ſo renowned a
commander, ſtimulated him to engage at that
great diſadvantage. Upon the firſt ſignal the ac-
tion began; and one of the king's wings gave way,
victory ſeemed inclined to the Romans. But
that wing where the king fought in perſon repulſed
the enemy, and drove them to their intrenchments.
This advantage was in great part owing to the
elephants; a circumſtance which Curius perceiv-
ing, commanded a body of reſerve, which he had
poſted near the camp, to advance and attack thoſe
animals with burning torches; which frightened
and annoyed them in ſuch a degree, that they
wheeled about, broke into the phalanx, and put
that body into the utmoſt diſorder. The Ro-
mans taking advantage of this confuſion, charged
with ſuch fury that the enemy were entirely bro-
ken and defeated. Pyrrhus retired to Tarentum,
attended only by a ſmall body of horſe, leaving
the Romans in full poſſeſſion of his camp; which
they ſo much admired, that they imitated it as a
model ever after.

ARUSPICE, *s. f.* Divination by examining the
intrails of animals.

ARUSPICES, or HARUSPICES, in Roman antiquity, an order of priests who pretended to foretel future events by inspecting the intrails of victims killed in sacrifice; they were also consulted on occasion of portents and prodigies. The haruspices were always chosen from the best families; and as their employment was of the same nature as that of the augurs, they were as much honoured. Their college, as well as those of the other religious orders, had its particular registers and records. Cato, who was an augur, used to say, he wondered how one *haruspex* could look at another without laughing in his face; from which we learn what opinion he had of the solidity of the aruspicina.

ARUSPICI LIBRI, a kind of sacred writings among the ancient Hetrurians, wherein the laws and discipline of the aruspices were described.

ARUSPICINA, the art of the ARUSPICES.

ARVUM, in ancient agriculture, properly denoted ground ploughed but not sowed. The word is sometimes extended to all arable, or corn-land, in contradistinction from pasture.

ARWERTON, a small town of Suffolk, NW. of Harwich, near the junction of the Orwell and the Stour.

(1.) ARX, in the ancient military art, a town, fort, or castle, for defence of a place. The arx, in ancient Rome, was a distinct edifice from the capitol, though some have confounded the two. According to Rycius, the arx, properly speaking, was a place on the highest part of the Capitoline Mount, stronger and better fortified than the rest, with towers and pinnated walls; in which was also the temple of Jupiter Capitolinus.

(2.) ARX was also a consecrated place on the Palatine Mount, where the augurs publicly performed their office. Some will have the arx to have been the augural temple; but Varro expressly distinguishes between the two. Of this arx the *fetiales*, or heralds, gathered the grass used in the ceremony of making leagues and treaties.

(3.) ARX BRITANNICA, a citadel of Batavia, whose foundation is seen at low water, near the old mouth of the middle Rhine: some imagine it the pharos or high tower of Caligula, as Suetonius calls it; a monument of Caligula's sham conquest of Britain. Others, that it was built by Drusus, with an altar afterwards by Claudius, on his expedition into Britain. But the usual passage was from Gessoriacum; and Suetonius expressly says, Claudius passed over thence. The ancient name of this citadel, now covered by the sea, is no where expressed: Now commonly called *'t Huis Britten*, or *Brittenburg*; that is, *Area Britannica*; but from what authority does not appear.

ARYTÆNOIDES, in anatomy, two cartilages which, with others, constitute the head of the larynx. It is also applied to some muscles of the larynx.

ARYTÆNOIDEUS, in anatomy, one of the muscles serving to close the larynx.

ARYTHMUS, in medicine, the want of a just modulation in the pulse. It is opposed to *eurythmus*, a pulse modulated agreeably to nature.

ARZEO, or AARSEO, a town of Algiers, near the mouth of the Mina. Lon 2. 10. E. Lat. 36. 50. N.

ARZEW, a sea-port of Algiers.

ARZILLA, a very ancient maritime [illegible] Africa, in the kingdom of Fez, about [illegible] SSW. of Tangiers. Walker makes it [illegible] built at the mouth of a river, and inhabited by Moors and Jews, who carry on no trade. It was formerly a Roman colony; afterward it [illegible] the government of the Goths, and was [illegible] by the Mahometans. Alphonso of Portugal, named the African, took it by assault in 1471, and brought away the presumptive heir of the throne. After that prince came to the throne, he attempted it, in 1508, with 100,000 men; but was obliged to abandon the undertaking. However, in 1577, the Portuguese forsook it of their own accord. Lon. 5. 40. W. Lat. 35. 40. N.

ARZINA, a river of Lapland.

(I. 1.) AS, among the ancient Romans, a particular weight, consisting of 12 ounces; the same with *libra*, or the Roman pound. It is derived from the Greek ας, which in the Doric dialect is used for ις, *one*, q. d. an unit; though others will have it named *as* quasi *æs*, because made of brass.

(2.) As was also the name of a Roman coin, which was of different weight and different matter in different ages of the commonwealth. Under Numa Pompilius, according to Eutropius, the Roman money was either of wood, as in the time of shells. In the time of Tullus Hostilius, it was of brass; and called, *as*, *libra*, *libella*, or *pondo*, because actually weighing a pound or 12 ounces. About 420 years after, the first Punic war having exhausted the treasury, they reduced the *as* to two ounces. In the second Punic war, Hannibal pressing very hard upon them, they reduced the *as* to half its weight, viz. to one ounce. And in the time of the Papirian law, they took away half an ounce more, and consequently reduced the *as* to the diminutive weight of half an ounce: and it is generally thought that it continued the same in the time of the commonwealth, and even till the reign of Augustus. The *as*, therefore was of four sorts of weights in the commonwealth. The original of it was that of a sheep, ox, or sow: but it was soon changed with two faces, and on the reverse the rostrum or prow of a ship.

(3.) As was also used to denote any entire whole. Whence the English word *ass*.—It also signified the whole inheritance; whence *heres ex asse*, the heir to the whole estate.

(II.) * As, *conjunct*, [*als*, Teut.] 1. In the same manner with something else.—I love you *as* I think *as* I did, I love you *as* I did; but [illegible] are to no purpose: the world will not [illegible] or love *as* I do. *Swift*. 2. In the manner [illegible] The landlord, in his shirt *as* he was, [illegible] dle in one hand, and a drawn sword in [illegible] ventured out of the room. *Arbuthnot*. [illegible] 3. That; in a consequential sense.—The [illegible] est mariners were so conquered by the [illegible] they thought it best with stricken [illegible] be governed by it. *Sidney*. 4. In the [illegible] ther.—

Madam, were I *as* you, I'd take [illegible]
I'd speak my own distress. *Addison*.

5. Under a particular consideration; [illegible]

lar respect.—Besides that law which concern-
men *as* men, and that which belongs unto
as they are men, linked with others in some
ty; there is a third which touches all several
es politick, so far forth *as* one of them hath
ic concerns with another. *Hooker.* 6. Like;
e same kind with.—A simple idea is one uni-
idea, *as* sweet, bitter. *Watts.* 7. In the
degree with.—

Where you, unless you are *as* matter blind,
nduct and beauteous disposition find,
Blackmore.

if; according to the manner that would be if.—
The squire began nigher to approach,
id wind his horn under the castle-wall,
iat with the noise it shook *as* it would fall.
Fairy Queen.

ey all contended to creep into his humour,
o do that, *as* of themselves, which they con-
d he desired they should do. *Hayward.*—
ccording to what.—Who then is Paul, and
is Apollos, but ministers by whom ye be-
l, even *as* the Lord gave to every man. 1
10. As it were; in some sort.—As for the
hters of king Edward IV. they thought king
ard had said enough for them; and took them
but *as* of the king's party, because they
in his power, and at his disposal. *Bacon.* 11.
le; at the same time that.—

These haughty words Alecto's rage provoke,
id frighted Turnus trembled *as* she spoke.
Dryden.

because.—He that commanded the injury to
one, is first bound; then he that did it; and
also are obliged who do so assist, *as* without
the thing could not have been done. *Taylor.*
because it is; because they are.—The kernels
out of the earth juice fit to nourish the tree,
ose that would be trees themselves. *Bacon.*
equally.—

As many voices issue, and the sound
Sybil's words *as* many times rebound. *Dryd.*
low; in what manner.—Men are generally
itted to publish books, and contradict others,
ven themselves, *as* they please, with as little
er of being confuted, as of being understood.
16. With; answering to *like* or *same*—

Sister, well met; whither away so fast?—
Upon the like devotion *as* yourselves,
gratulate the gentle princes there. *Shak.*
a reciprocal sense, answering to *as*.—Every
e committed in the state of nature, may, in
ate of nature, be also punished, and *as* far
as it may in a commonwealth. *Locke.* 18.
before *as*, in a comparative sense; the first
ing sometimes understood.—

Sempronius is *as* brave a man *as* Cato. *Addis.*
Answering to *such*.—Is it not every man's in-
, that there should be *such* a governour of
orld *as* designs our happiness, *as* would go-
us for our advantage? *Tillotson.* 20. Having
answer it; in a conditional sense.—*As* far *as*
carry light and conviction to any other man's
standing, *so* far, I hope, my labour may be
to him. *Locke.* 21. *So* is sometimes under-
.—*As* in my speculations, I have endeavour-
extinguish passion and prejudice, I am still
desirous of doing some good in this particular.
Spectator. 22. Answering to *so* conditionally.—

So may th' auspicious queen of love,
To thee, O sacred ship, be kind;
As thou to whom the muse commends,
The best of poets and of friends,
Dost thy committed pledge restore. *Dryden.*

23. Before *how* it is sometimes redundant; but this is in low language.—

As how, dear Syphax? *Addison's Cato.*

24. It seems to be redundant before *yet*; to this time.—Though that war continued nine years, and this hath *as* yet lasted but six, yet there hath been much more action in the present war. *Addison.* 25. In a sense of comparison, followed by *so*.—

As when a dab-chick waddles thro' the copse
On feet and wings, and flies, and wades, and
hops;
So lab'ring on, with shoulders, hands and head,
Wide as a windmill all his figure spread. *Pope.*

26. As FOR; with respect to.—*As for* the rest of those who have written against me, they deserve not the least notice. *Dryden's Fables Preface.* 27. As IF; in the same manner that it would be if.—Answering their questions, *as if* it were a matter that needed it. *Locke.* 28. As THOUGH; as if.—These should be at first gently treated, *as though* we expected an imposthumation. *Sharp's Surgery.* 29. As TO; with respect to.—

I pray thee, speak to me *as to* thy thinkings,
As thou dost ruminate; and give thy worst of
thoughts
The worst of words. *Shakesp. Othello.*

—They pretend, in general, to great refinements, *as* to what regards Christianity. *Addison on Italy.* 30. As WELL AS; equally with.—Each man's mind has some peculiarity, *as well as* his face, that distinguishes him from all others. *Locke.*

(I.) ASA, [אָסָא, Heb. i. e. a healer of sickness.] king of Judah, succeeded his father Abijam, A. M. 2988. He abolished idolatry, restored the worship of the true God, and, with the assistance of Benhadad king of Syria, took several towns from the king of Israel. He died A. A. C. 917, and was succeeded by Jehoshaphat.

(II. 1.) ASA among naturalists, a word taken by modern authors from the Arabs of the ancients, and applied to a gum very different from that anciently known by the name they have thus corrupted. The asa of the ancients was an odoriferous and fragrant gum; and the asa of the after ages had so little title to this epithet, that they distinguished it by an additional one, expressing its being of an offensive smell. See § 4. The Arabian writers, according to this distinction, describe two kinds of asa, the one stinking, the other aromatic; and the modern Greeks preserved the name *asa* or *hasa*, to the stinking gum the Latins called by that name, but added a distinctive epithet to express its smell, and called it *scarabæarum*.

(2.) ASA, or ASSA, in the materia medica, a name given to two very different substances, called *asa dulcis* and *asa fœtida*.

(3.) * ASA DULCIS. See BENZOIN.

(4.) * ASA FŒTIDA, ASSA FŒTIDA. *n. s.* A gum or resin brought from the East Indies, of a sharp

ſharp taſte, and a ſtrong offenſive ſmell; which is ſaid to diſtil during the heat of ſummer, from a little ſhrub. *Chambers.*

(5.) ASA FOETIDA. See FERULA.

ASAD-ABAD, or ASED-ABAD, a town of Perſia, 68 miles NE. of Amadan. Lon. 48. 25. E. Lat. 36. 20. N.

ASAHEL, [יהוה, Heb. i. e. God has wrought,] one of the ſons of Zeruiah, David's ſiſter, and the younger brother of Joab. He was one of David's 30 heroes, and was remarkable for his ſwiftneſs. At the battle of Gibeon, he purſued Abner with ſo much obſtinacy, that he was obliged to kill him in ſelf defence, though it would appear with reluctance. II Sam. ii. 19—23.

ASALT, a village in Cornwall.

(1.) ASAPH, [יהוה, Heb. i. e. gathering,] the ſon of Berachiah, a Gerſhomite, and a famous muſician and pſalmiſt under David king of Iſrael.—Twelve of the Pſalms bear his name, but it is doubted whether he was the author of them all, as ſome of them relate to later times.

(2.) ASAPH, ST, a city of Flintſhire, in N. Wales, ſituated in a pleaſant valley, at the confluence of the Elway and Cloyd; 24 miles W. of Cheſter, and 209 NW. of London. Lon. 3. 36. W. Lat. 53. 12. N. As a biſhopric, it is of great antiquity, and was founded about A. D. 560, by Kentigern, a Scotſman, biſhop of Glaſgow.—He began the church on the banks of the river Elwy, whence it is called by the Welch *Land Elwy*, and in Latin *Elwenſis*. Kentigern returning into Scotland, left a holy man his ſucceſſor, St Aſaph. Who was his ſucceſſor is uncertain, as there are no records that mention it; and it ſeems rather probable that the religious ſettled here had been neceſſitated to remove to ſome more peaceful abode, as the country was frequently the ſeat of war between the Engliſh and the Welch. This ſee was formerly very lucrative, but its revenues were greatly leſſened by the profuſion of biſhop Parſew, who alienated much of the lands belonging to it. This dioceſe does not contain any one whole county; but conſiſts of part of Denbigh, Flint (where its church is), Montgomery, and Merioneth ſhires, and a ſmall part of Shropſhire; wherein are 121 pariſhes, and 131 churches and chapels, moſt of which are in the immediate patronage of the biſhop. This ſee has but one archdeaconry, viz. that of St Aſaph, which is united to the biſhopric, for the better maintenance thereof. It is valued in the king's books at L.187: 11, 6. but computed to be worth, annually, L.1500. The tenth of the clergy comes to L. 186: 19: 6½. To this cathedral belong a biſhop, a dean, archdeacon, chancellor, &c.

(3.) ASAPH, ST, was a native of N. Wales, deſcended of an ancient family and flouriſhed under Carentius, king of the Britons, about A. D. 590. Being a monk in the convent of Llan Elvy, under Kentigern, he behaved with ſuch ſanctity, that Llan-Elvy got his name ever after. See N° 2. He wrote the ordinances of his church, and the life of St Kentigern. Bayle ſays, he was the firſt who received unction from the pope.

ASAPHRIS, [ἀσαφὴς, from α, negative, and σαφὴς, clear,] perſons who do not utter their words in a clear manner. The defect is occaſioned, Galen ſays, "either by ſome hurt which the organs of ſpeech have contracted from a diſorder of the nerves, or elſe by a delirium."

ASAPHY, [ἀσαφία, Gr.] hoarſeneſs, or lowneſs of voice.

ASAPPES, or AZAPES, an order of ſoldiers in the Turkiſh army, whom they always expoſe to the firſt ſhock of the enemy; to the end that the enemy being thus fatigued, and their ſwords blunted, the ſpahis and janiſaries may fall on and find an eaſy conqueſt. The word is derived from the Turkiſh *ſaph*, which ſignifies *rank*, from whence they have formed *aſſhaph*, to range in battle.—The aſappes are ſaid to be held of ſo little value, that they frequently ſerve as bridges for the cavalry to paſs over in bad roads, and as faſcines to fill up the ditches of places beſieged! They travel on foot, and have no pay but the plunder they can get from the enemy.

ASAR, a gold coin current at Ormus, in the Perſian gulf, worth 6s. 8d.

* ASARABACCA. *n. ſ.* [*aſarum*, Lat.] The name of a plant.

ASAR-ADDON. See ESAR-HADDON.

ASARINA. See CHELONE.

ASAROTA, [ἀσαρωτὰ, from α and σαίρω, I ſweep,] a kind of painted pavements in uſe before the invention of Moſaic work. The moſt celebrated was that at Pergamus, painted by Seſus, and exhibiting the appearance of crumbs, as if the floor had not been ſwept after dinner, whence, according to Pliny, the denomination. Perrault ſuppoſes them to have been a black kind of pavement of a ſpongy matter.

(I.) ASARUM, ASARABACCA: A genus of the monogynia order, belonging to the dodecandria claſs of plants. The calyx is trifid or quadrifid, and reſts on the germen; there is no corolla; the capſule is leathery and crowned. There are 3 ſpecies, viz.

1. ASARUM CANADENSE, a native of Canada.

2. ASARUM EUROPÆUM, grows naturally in ſome parts of England. It has thick fleſhy jointed roots; the leaves grow ſingly upon ſhort foot ſtalks which ariſe immediately from the root: the flowers grow upon very ſhort foot ſtalks cloſe to the ground, ſo are hid under the leaves. They have a bell ſhaped impalement, of a worn-out purple colour, which is cut in three at the top, where it turns backward. It delights in a moiſt ſhady place, and may be propagated by parting the roots in autumn.

3. ASARUM VIRGINICUM, a native of America, has no remarkable properties.

(II.) ASARUM, MEDICINAL USES OF THE. The dried roots of this plant have been generally brought from the Levant; thoſe of our own growth being ſuppoſed weaker. Both the roots and leaves have a naſeous, bitter, acrimonious, hot taſte; their ſmell is ſtrong, and not very diſagreeable. Given in ſubſtance from half a dram to a dram, they evacuate powerfully both upwards and downwards. It is ſaid, that tinctures made in ſpirituous menſtrua, poſſeſs both the emetic and cathartic virtues of the plant; that the extract obtained by inſpiſſating theſe tinctures acts only by vomit, and with great mildneſs; that an infuſion in water proves cathartic, rarely emetic;

tic; that aqueous decoctions made by long boiling, and the watery extract, have no purgative or emetic quality, but prove notable diaphoretics, diuretics, and emmenagogues. The principal uſe of this plant among us is a ſternutatory. The root of aſarum is perhaps the ſtrongeſt of all the vegetable errhines, white hellebore itſelf not excepted. Snuffed up the noſe, in the quantity of a grain or two, it occaſions a large evacuation of mucus, and raiſes a pientiful ſpitting. The leaves are conſiderably milder, and may be uſed to the quantity of 3, 4, or 5 grains. Geoffrey relates, that after ſnuffing up a doſe of this errhine at night, he has frequently obſerved the diſcharge from the noſe to continue for 3 days together; and that he has known a paralyſis of the mouth and tongue cured by one doſe. He recommends this medicine in ſtubborn diſorders of the head proceeding from viſcid tenacious matter, in palſies, and in ſoporific diſtempers. The leaves are the principal ingredient in the *pulvis ſternutatorius*, or *pulvis aſari compoſitus*, as it is now called, of the ſhops.

ASASI, in botany, a name given, by the people of Guinea, to a tree, the leaves of which being boiled in water, and held to the mouth, cure the tooth-ach. In its form and manner of growing, it reſembles the laurel; the leaves are very hard and ſtiff, and grow alternately on the ſtalks; they have ſhort pedicles, and the branches are blackiſh and rugged, but variegated with ſmall reddiſh ſpangles, or ſcaly protuberances.

ASBAMEA, in ancient geography, a fountain of Cappadocia, near Tyana, ſacred to Jupiter, and to an oath. Though this fountain bubbled up, as in a ſtate of boiling, yet its water was cold; and never ran over, but fell back again.

* ASBESTINE. *adj.* [from *aſbeſtos*.] Something incombuſtible, or that partakes of the nature and qualities of the *lapis aſbeſtos*.

(1.) * ASBESTOS. *n. ſ.* [ἀσβεστος.] A ſort of native foſſile ſtone, which may be ſplit into threads and filaments, from one inch to ten inches in length, very fine, brittle, yet ſomewhat tractable, ſilky, and of a greyiſh colour. It is almoſt inſipid to the taſte, indiſſoluble in water, and endued with the wonderful property of remaining unconſumed in the fire. But in two trials before the Royal Society, a piece of cloth made of this ſtone was found to loſe a dram of its weight each time. This ſtone is found in Angleſey in Wales, and in Aberdeenſhire in Scotland. *Chambers*.

(2.) ASBESTOS, COUNTRIES THAT PRODUCE THE. Beſides Scotland and Wales, the abeſtos is found in Crete and Cyprus; in Tartary; at Tamur in the Low Countries; in Thuringia among the mines; in the Old Noricum, in Egypt; the mountains of Arcadia; at Puteoli; in the land of Corſica; at Montauban in France; and Siberia.

(3.) ASBESTOS, MANUFACTURE OF THE. The induſtry of mankind has found a method of working this untoward mineral, and employing it in vers manufactures, chiefly cloth and paper. The manufacture is undoubtedly difficult enough. Pliny calls the aſbeſtos *inventu rarum, textu difficilimum*. Wormius aſſures us, that the method of making cloth of aſbeſtos, is now entirely unknown. And indeed one would ſcarce imagine the thing practicable, without the mixture of ſome other pliant matter, as wool, hemp, or flax, along with the aſbeſtos, the filaments of this latter appearing too coarſe and brittle to make any tolerable fine work. However this be, Bapt. Porta aſſures us, that in his time the ſpinning of aſbeſtos was a thing known to every body at Venice. Sig. Caſtagnatta, ſuperintendant of ſome mines in Italy, is ſaid to have carried the manufacture to ſuch perfection, that his aſbeſtos was ſoft and tractable, much reſembling lamb-ſkin dreſſed white: he could thicken and thin it at pleaſure, and thus either make it into a very white ſkin or a very white paper. The method of preparing the incombuſtible paper and cloth is thus deſcribed by Ciampini: The ſtone is laid to ſoak in warm water; then opened and divided by the hands, that the earthy matter may be waſhed out. The ablution being ſeveral times repeated, the flax-like filaments are collected and dried; and they are moſt conveniently ſpun with an addition of flax. Two or three filaments of the aſbeſtos are eaſily twiſted along with the flaxen thread, if the operator's fingers are kept oiled. The cloth alſo, when woven, is beſt preſerved by oil from breaking or waſting. On expoſure to the fire, the flax and the oil burn out, and the cloth remains pure and white. The ſhorter filaments which ſeparate in waſhing the ſtone, may be made into paper in the common manner.

(4.) ASBESTOS, VALUE AND USES OF THE. The aſbeſtos cloth was chiefly eſteemed by the ancients; though then better known and more common than among us, being held equally precious with the richeſt pearls: nor is it now of mean value, even in the country where it is moſt generally made, a China cover (i. e. a piece of 23 inches and three quarters long) being worth 80 tale, i. e. L. 36 : 13 : 4. Pliny ſays, he himſelf had ſeen napkins thereof, which, being taken foul from the table after a feaſt, were thrown into the fire, and by that means were better ſcoured than if they had been waſhed in water, &c. But its principal uſe, according to Pliny, was for the making of ſhrouds for royal funerals, to wrap up the corpſe, ſo that the aſhes might be preſerved diſtinct from thoſe of the wood, &c. whereof the funeral pile was compoſed: and the princes of Tartary, according to the accounts in the Philoſophical Tranſactions, ſtill uſe it in burning their dead. Some of the ancients are ſaid to have made clothes of it, particularly the Brachmins among the Indians. The wicks for their perpetual lamps, according to Dr Liſter, were alſo made of it; ſome ſtill uſe it for the wicks of ſuch lamps as they would not have any trouble with; becauſe the aſbeſtos never waſting, there is no occaſion for ſhifting the wick. Septalis, canon of Milan, had thread, ropes, nets, and paper made of the aſbeſtos. A handkerchief or pattern of this linen was long ſince preſented to the Royal Society, a foot long and half a foot broad. This gave two proofs of its reſiſting fire; though in both experiments, it loſt above 3 drams of its weight. This probably aroſe from the diſſipation of ſome remains of the oil or flax above mentioned (See § 2.) for pure aſbeſtos loſes nothing by ignition.—

When taken out red hot, it did not burn a piece of white paper on which it was laid. Mr Viletti pretends that his large burning concave usually vitrifies the asbestos.

ASBORN. See ASHBORN.

ASCALON, an ancient city, one of the 5 satrapies or principalities of the Philistines; situated on the Mediterranean, 43 miles SW. of Jerusalem, between Azotus on the N. and Gaza on the S. It was the birth-place of Herod the Great, thence surnamed *Ascalonita*, and was famous for its scallions, which take name from this town. It is now called SCALONA. Lon. 34. 30. E. Lat. 31. 30.

ASCANIA, an ancient town of Germany, now called ASCHERLEBEN.

ASCANIUS, the son of Æneas and Creusa, succeeded his father in the kingdom of the Latins, and defeated Mezentius king of the Tuscans, who had refused to conclude a peace with him. He founded Alba Longa; and died about A. A. C. 1139, after reigning 38 years.

(1.) * ASCARIDES. *n. f.* [ασκαριδες, from ασκαριζω, to leap.] Little worms in the rectum, so called from their continual troublesome motion, causing an intolerable itching. *Quincy.*

(2.) ASCARIS, in zoology, a genus of insects belonging to the order of vermes intestina. The body of the ascaris is cylindrical, filiform, and tapers at both ends. See Plate XIII. fig. 16.—There are 2 species, viz.

1. ASCARIS LUMBRICOIDES is about the same length with the lumbricus terrestris, or common earth worm; but it wants the protuberant ring towards the middle of the body, the only mark by which they can properly be distinguished.—The body of the lumbricoides is cylindrical, and subulated at each extremity; but the tail is somewhat triangular. The lumbricoides is the worm which is most commonly found in the human intestines. It is viviparous, and produces vast numbers.

2. ASCARIS VERMICULARIS, with faint annular rugæ, and the mouth transverse, is about a quarter of an inch long, and thicker at one end than the other. It is found in boggy places, in the roots of putrid plants, and very frequently in the rectum of children and horses. It emaciates children greatly, and is sometimes vomited up. For the method of expelling these two kinds of insects, see MEDICINE, *Index*.

(1.) * *To* ASCEND. *v. a.* To climb up any thing.—They *ascend* the mountains, they descend the vallies. *Delaney's Revelation examined.*

(2.) * *To* ASCEND. *v. n.* [*ascendo*, Lat.] 1. To move upwards; to mount; to rise.—

Then to the heav'n of heav'ns shall he *ascend*,
With victory, triumphing through the air
Over his foes and thine. *Milton.*

2. To proceed from one degree of good to another.—By these steps we shall *ascend* to more just ideas of the glory of Jesus Christ. 3. To stand higher in genealogy.—The only incest was in the *ascending*, not collateral branch; as when parents and children married, this was accounted incest. *Broome.*

* ASCENDABLE. *adj.* [from *ascend.*] That may be ascended. *Dict.*

(1.) * ASCENDANT. *adj.* 1. Superiour; predominant; overpowering.—Christ outdoes Moses before he displaces him; and shews an *ascendant* spirit above him. *South.* 2. In an astrological sense, above the horizon.—Let him study the constellation of Pegasus, which is about that time *ascendant*. *Brown's Vulgar Errours.*

(2.) * ASCENDANT. *n. f.* [from *ascend.*] 1. The part of the ecliptick at any particular time above the horizon, which is supposed by astrologers to have great influence. 2. Height; elevation.—He was initiated, in order to gain instruction in sciences that were there in their highest *ascendant*. *Temple.* 3. Superiority; influence.—By the *ascendant* he had in his understanding, and the dexterity of his nature, he could persuade him very much. *Clarendon.* 4. One of the degrees of kindred reckoned upwards.—The most nefarious kind of bastards are incestuous bastards, which are begotten between *ascendants* and descendants *in infinitum*; or between collaterals, as far as the divine prohibition. *Ayliffe's Parergon.*

(3.) ASCENDANT, in astrology, denotes the horoscope, or the degree of the ecliptic which rises upon the horizon at the time of the birth of any one. This is supposed to have an influence on the person's life and fortune, by giving him a bent and propensity to one thing more than another. In the jargon of astrologers, it is also called the *first house*, the *angle of the East* or *Oriental angle*, and the *significator of life*.—Such a planet rules his *ascendant*: Jupiter was in his *ascendant*, &c.—Hence the word is also used in a moral sense, for a certain superiority which one man has over another, from some unknown cause.

(4.) ASCENDANTS, in law, are opposed to descendants in succession; i. e. when a father succeeds his son, or an uncle his nephew, &c. he is said to ascend, or go to ascendants.

* ASCENDENCY. *n. f.* [from *ascend.*] Influence; power.—Custom has some *ascendency* over understanding, and what at one time seemed decent, appears disagreeable afterwards. *Watts.*

ASCENDING, in astronomy, is said of the stars as are rising above the horizon in any part of the equator. And thus likewise,

1. ASCENDING LATITUDE, is the latitude of a planet when going towards the north pole.

2. ASCENDING NODE, is that point of a planet's orbit, wherein it passes the ecliptic, to proceed northward. This is otherwise called the *northern node*, and represented by this character ☊.

ASCENDING SIGNS, among astrologers, are those which are upon their ascent, or rise, from the nadir, or lowest part of the heavens, to the zenith or highest.

ASCENDING VESSELS, in anatomy, those which carry the blood upwards; as the aorta ascendens. See ANATOMY, *Index.*

(1.) * ASCENSION. *n. f.* [*ascensio*, Lat.] 1. The act of ascending or rising; frequently applied to the visible elevation of our Saviour to heaven.—

Then rising from his grave,
Spoil'd principalities, and pow'rs, triumph'd
In open shew; and, with *ascension* bright,
Captivity led captive through the air. *Par. L.*

2. The thing rising, or mounting.—Mist or

he theory of inebriation, conceiving the brain oth only ſuffer from vaporous *aſcenſions* from the omach. *Brown's Vulgar Errours.*

(2.) * ASCENSION, in aſtronomy, is either *right* r *oblique*. *Right aſcenſion* of the ſun, or a ſtar, is at degree of the equinoctial, counted from the ries, which riſes with the ſun or ſtar in a right phere. *Oblique aſcenſion* is an arch of the equator tercepted between the firſt point of Aries, and at point of the equator which riſes together ith a ſtar in an oblique ſphere.

(3.) ASCENSION, in geography, an uninhabited rren iſland on the coaſt of Africa, about 600 iles NW. of St Helena. The following acount is given of it by Mr Forſter. "This iſland as firſt diſcovered in 1501, by Joaõ de Nova alego, a Portugueſe navigator, who named it *ha de Noſſa Senhora de Conceiçao*. The ſame adiral, on his return to Portugal in 1502, diſcoered the iſland of St Helena, which obtained that ame from the day of the diſcovery. Aſcenſion as ſeen a ſecond time by Alfonſo d'Albuquerque s his voyage to India in 1503, and received the ame it now bears: but it was at that time in the me deſolate condition as at preſent. We ſent veral parties on ſhore, who paſſed the night on ie watch for turtles, which came to lay their gs on the ſandy ſhores. The drearineſs of this land ſurpaſſed all the horrors of Eaſter Iſland and 'erra del Fuego, even without the aſſiſtance of ow. It was a ruinous heap of rocks, many of hich, as far as we could diſcern from the ſhip, emed to be totally changed by the fire of a volano. Nearly in the centre of the iſland riſes a road white mountain of great height, on which 'e diſcerned ſome verdure by the help of our laſſes, from whence it has obtained the name of ie *Green Mountain*. We landed eaſily in the orning among ſome rocks, the ſurf being always nmenſely high on the great beach; which conſts of minute ſhell ſand, chiefly of a ſnowy white, ery deep, dry, and intolerable to the eyes when he ſun ſhines. We aſcended among heaps of lack cavernous ſtone, which perfectly reſembles he moſt common lavas of Veſuvius and Iceland, nd of which the broken pieces looked as if they ad been accumulated by art. The lava currents ooling very ſuddenly, may eaſily be imagined to roduce ſuch an effect. Having aſcended about 2 or 25 yards perpendicular, we found ourſelves n a great level plain of 6 or 8 miles in circuit; in he different corners of which we obſerved a large ill of an exact conical ſhape, and of a reddiſh olour ſtanding perfectly inſulated. Part of the lain between theſe conic hills was covered with reat numbers of ſmaller hillocks, conſiſting of the ame wild and ragged lava as that near the ſea, nd ringing like glaſs when two pieces are knocked together. The ground between the heaps of ava was covered with a black earth, on which we alked very firmly; but when theſe heaps did ot appear, the whole was a red earth, which vas ſo looſe, and in ſuch dry minute particles, hat the wind raiſed clouds of duſt upon it. The conic hills conſiſted of a very different ſort of lava, which was red, ſoft, and crumbling into earth. One of theſe hills ſtands directly in front of the bay, and has a wooden croſs on its ſummit, from whence the bay is ſaid to take its name. Its ſides are very ſteep, but a path near three quarters of a mile long, winds round it to the ſummit. After examining this remarkable country a little longer, we concluded, with a great degree of probability on our ſide, That the plain on which we ſtood was once the crater or ſeat of a volcano, by the accumulation of whoſe cinders and pumice-ſtones the conic hills had been gradually formed: that the currents of lava which we now ſaw divided into many heaps, had perhaps been gradually buried in freſh cinders and aſhes; and the waters coming down from the interior mountain in the rainy ſeaſon had ſmoothened every thing in their way, and filled up by degrees the cavity of the crater. The rocky black lava was the reſidence of numberleſs men-of-war birds and boobies, which ſat on their eggs, and ſuffered us to come cloſe to them. About eight in the evening, it being then quite dark, a ſmall veſſel came into the bay, and anchored directly within us. Captain Cook having hailed her repeatedly, received in anſwer that ſhe was the Lucretia, a New York ſloop, which had been at Sierra Leon, and was now come to catch turtles, in order to ſell them at the windward iſlands of the Weſt Indies. A lieutenant was ſent on board, who learned from the maſter, that he had taken our ſhip to be a French Indiaman, and was very deſirous of trading with Engliſh India-ſhips, in which he was diſappointed by the company's regulations. He dined with our officers the next day, but on the 30th at day-break left the iſland. On the 30th in the morning, we landed a ſecond time; and, croſſing the plain, arrived at a prodigious lava current, interſected by many channels from ſix to eight yards deep, which bore ſtrong marks of being worn by vaſt torrents of water, but were at preſent perfectly dry, the ſun being in the northern hemiſphere. In theſe gullies we found a ſmall quantity of ſoil conſiſting of a black volcanic earth, mixed with ſome whitiſh particles gritty to the touch. Here we ſaw ſome ſmall bunches of purſlane, and a ſpecies of graſs (*panicum ſanguineum*) which found ſufficient nutriment in the dry ſoil. Having at laſt, with great fatigue, climbed over this extenſive and tremendous current of lava, which was much more ſolid than the heaps nearer to the ſea, we came to the foot of the Green Mountain, which even from the ſhips place in the bay we had plainly diſtinguiſhed to be of a different nature from all the reſt of the country. Thoſe parts of the lava which ſurrounded it were covered with a prodigious quantity of purſlane, and a kind of new fern (*lonchites Aſcenſionis*,) where ſeveral flocks of wild goats were feeding. The great mountain is divided in its extremities, by various clefts, into ſeveral bodies; but in the centre they all run together, and form one broad maſs of great height. The whole appears to conſiſt of a gritty tophaceous lime-ſtone, which has never been attacked by the volcano, but probably exiſted prior to its eruption; its ſides are covered with a kind of graſs, peculiar to the iſland, which Linnæus has named *ariſtida Aſcenſionis*. We likewiſe obſerved ſeveral flocks of goats feeding on it; but they were all exceedingly thy, and ran with ſurpriſing velocity along tremendous precipices, where it was impoſſible to follow them.

The maſter of the New York ſloop acquainted us, that there is a ſpring of water on one part of this mountain, which falls down a great precipice, and is afterwards abſorbed in the ſand. I am almoſt perſuaded, that, with a little trouble, Aſcenſion might ſhortly be made fit for the reſidence of men. The introduction of furze *(ulex Europeus,)* and of a few other plants which thrive beſt in a parched ſoil, and are not likely to be attacked by rats or goats, would ſoon have the ſame effect as at St Helena. The moiſture attracted from the atmoſphere by the high mountains in the centre of the iſland, would then no longer be evaporated by the violent action of the ſun, but collect into rivulets, and gradually ſupply the whole iſland. A ſod of graſſes would every where cover the ſurface of the ground, and annually increaſe the ſtratum of mould, till it could be planted with more uſeful vegetables. We returned gradually to Croſs Bay, in the heat of noon, over the plain; having a ſpace of more than five miles to traverſe, where the ſun burnt and bliſtered our faces and necks, and heated the ſoil to ſuch a degree, that our feet were likewiſe extremely ſore. About 3 o'clock we arrived at the water's ſide; and after bathing in a ſmall cove among a few rocks, we made the ſignal for a boat, and were taken on board. The next forenoon we made another ſmall excurſion, in company with Captain Cook, towards the Green Mountain; but we were all of us ſo much fatigued, that we could not reach it. We made no new obſervations in the courſe of this day, the nature of the iſland being dreary beyond deſcription in its outſkirts."—The Eaſt India ſhips often touch at this iſland, as it has a ſafe harbour, and take in quantities of turtle, which are very plentiful in it. Lon. 17. 30. W. Lat. 7. 5. S.

(4.) * ASCENSION DAY. The day on which the aſcenſion of our Saviour is commemorated, commonly called Holy Thurſday; the Thurſday but one before Whitſuntide.

(1.) * ASCENTIONAL DIFFERENCE, is the difference between the right and oblique aſcenſion of the ſame point to the ſurface of the ſphere. *Chambers.*

(2.) ASCENSIONAL DIFFERENCE of the ſun, converted into time, is juſt ſo much as he riſes before or after ſix o'clock.

* ASCENSIVE. *adj.* [from *aſcend.*] In a ſtate of aſcent; not in uſe.—The cold augments when the days begin to increaſe, though the ſun be then *aſcenſive*, and returning from the winter tropick. *Brown's Vulgar Errours.*

ASCENSORIUM, in ancient writings, a ſtair, or ſtep.

(1.) * ASCENT. *n. ſ.* [*aſcenſus*, Lat.] 1. Riſe; the act of riſing; the act of mounting.—

To him with ſwift *aſcent* he up return'd,
Into his bliſsful boſom reaſſum'd
In glory, as of old. *Milton.*

2. The way by which one aſcends.—The temple, and the ſeveral degrees *aſcent*, whereby men did climb up to the ſame, as if it had been a *ſcala cæli*, be all poetical and fabulous. *Bacon.*—

No land like Italy erects the ſight,
By ſuch a vaſt *aſcent*, or ſwells to ſuch a height. *Addiſon.*

(2.) ASCENT, in aſtronomy, &c. See ASCENSION.

(3.) ASCENT, in logic, denotes a kind of argumentation, wherein we riſe from particulars to univerſals. As, when we ſay, this man is an animal, and that man is an animal, and the other man, &c. therefore, every man is an animal.

(4.) ASCENT, in phyſics, implies the motion of a body upwards, or the continual receſs of a body from the earth. The Peripatetics attributed the ſpontaneous *aſcent* of bodies to a principle of *levity* inherent in them. The moderns deny ſpontaneous levity; and ſhow, that whatever aſcends, does it in virtue of ſome external impulſe or extruſion. Thus ſmoke and other rare bodies aſcend in the atmoſphere; and oil, light woods, &c in water; not by any internal principle of levity, but by the ſuperior gravity or tendency downwards of the parts of the medium where they are. The aſcent of light bodies in heavy mediums is produced after the ſame manner as the aſcent of the lighter ſcale of a balance. It is not that ſuch ſcale has an internal principle whereby it immediately tends upwards; but it is impelled upwards by the preponderancy of the other ſcale; the exceſs of the weight of the one having the ſame effect, by augmenting its impetus downwards, as ſo much real levity in the other; by reaſon the tendencies mutually oppoſe each other, and that action and reaction are always equal.

(5.) ASCENT OF BODIES ON INCLINED PLANES. See MECHANICS.

(6.) ASCENT OF FLUIDS. See HYDROSTATICS.

(7.) ASCENT OF VAPOURS. See EVAPORATION.

* *To* ASCERTAIN. *v. a.* [*acertener*, Fr.] 1. To make certain; to fix, to eſtabliſh.—The divine law both *aſcertaineth* the truth, and ſupplieth unto us the want of other laws. *Hooker.* 2. To make confident; to take away doubt: often with *of*.—Right judgment of myſelf, may give me the other certainty, that is, *aſcertain* me that I am in the number of God's children. *Hammond.*

* ASCERTAINER. *n. ſ.* [from *aſcertain.*] The perſon that proves or eſtabliſhes.

* ASCERTAINMENT. *n. ſ.* [from *aſcertain.*] A ſettled rule; an eſtabliſhed ſtandard.—For want of *aſcertainment*, how far a writer may expreſs his good wiſhes for his country, innocent intentions may be charged with crimes. *Swift.*

ASCESIS, [from the verb, ασκεω, uſed by the ancients in ſpeaking of the ſports and combats of the athletæ,] properly denotes exerciſe of the body. It is alſo uſed by philoſophers, to denote an exerciſe conducive to virtue, or to the acquiring a greater degree of virtue. This is particularly denominated the *philoſophical aſceſis*, becauſe practiſed chiefly by philoſophers, who make a more peculiar profeſſion of improving themſelves in virtue; on the model whereof, the ancient Chriſtians introduced a religious Aſceſis.

ASCETERIUM, in eccleſiaſtical writers, a monaſtery, or place ſet apart for the exerciſes of religion. The word is formed from *aſceſis*, exerciſe: or *aſcetra*, one who performs exerciſe. Originally it ſignified a place where the athletæ or gladiators performed their exerciſes.

(1.) * ASCETICK, *adj.* [ασκητικος]. Employed wholly

olly in exercises of devotion and mortification. None lived such long lives as monks and her-a, sequestered from plenty to a constant *ascetick* rse of the severest abstinence and devotion. *ph.*

2.) * ASCETICK. *n. s.* He that retires to devo-n and mortification; a hermit.—I am far from mmending these *ascetick*s, that, out of a pre-ce of keeping themselves unspotted from the rld, take up their quarters in deserts. *Norris.* ie that preaches to man should understand at is in man; and that skill can scarce be at-ed by an *ascetick* in his solitudes. *Atterbury.*

3.) ASCETICS, persons in the primitive times, o devoted themselves to the exercises of piety, retired life, and particularly to prayer, absti-ce, and mortification. Afterwards, this title s bestowed upon the monks, especially such of m as lived in solitude. Ascetics is also a title several books of spiritual exercises; as, the *Asce-*, or devout exercises of St Basil, archbishop of sarea in Cappadocia, &c.

ASCHAFFENBURG, a town of Germany, seat-on the Maine, in the circle of the lower Rhine, l territory of the elector of Mentz, who has a lace there. It is memorable for being the place ere king George II. took up his quarters, the ght before the battle of Dettengen. Lon. 9. . E. Lat. 50. 14. N.

ASCHAM, Roger, was born at Kirby-Wiske, r North Allerton in Yorkshire, in the year 16. His father was steward to the noble fami-of Scroop. Roger was educated in the family Sir Anthony Wingfield, who, about the year 30, sent him to St John's College, Cambridge, ere he was soon distinguished for his applica-n and abilities. He took his degree of A. B. at age of 18, was soon after elected fellow of his lege, and in 1536, proceeded A. M. In 1544, was chosen university orator; and, in 1548, s sent for to court, to instruct the lady Eliza-th (afterwards queen) in the learned languages. 1550, he attended Sir Richard Morysine, as se-tary, on his embassy to the emperor Charles V. whose court he continued three years, and in mean time was appointed Latin secretary to lward VI. But upon the death of that prince, lost his preferment and all his hopes, being pro-fessedly of the reformed religion; yet, contrary to expectations, he was soon after, by the interest his friend, lord Paget, made Latin secretary to e king and queen. In June 1554, he married rs Margaret How, with whom he had a confi-rable fortune. It is very remarkable, that, ough Mr Ascham was known to be a Protestant, continued in favour not only with the ministry those times, but with Queen Mary herself. U-on the accession of Queen Elizabeth, he was not ily confirmed in his post of Latin secretary, but as employed as preceptor to her Majesty in the reek and Latin languages. He died in 1568, ot rich, but much regretted, especially by the ueen, who said she had rather lost L. 10,000. e wrote, 1. Toxophilus. The schole or parti-ons of shooting, contayned in two bookes, writ-n by Roger Ascham, 1544, and now newly per-fect. Pleasaunt for all gentlemen and yeomen of nglande, &c. Lond. 1571. Whilst at the univer-lity he was fond of archery by way of exercise and amusement; for which he was censured; and on that account he sat down to write this book, which was dedicated to Henry VIII. who settled a pension of L. 10 per annum upon the author. It is rather whimsical; but it is admirably well written, and full of learning. 2. A report and discourse, of the affairs and state of Germany, and the Em-ror Charles his court, &c. 4to. A valuable curio-ity. 3. The schoolmaster. First printed in 1573, 4to. Mr Upton published an edition with notes in 1711. It has uncommon merit, and is also expressive of the great humanity of the author, who was for making the paths of knowledge as pleasant as possible, and for trying every gentle method of enlarging the mind and winning the heart. 4. Latin epistles; first published by Mr Grant in 1576; and since passed in many editions: the best is that of Oxford in 1703. It is much admired on account of the style, and esteemed almost the only classical work of that kind written by an Englishman. 5. Apologia contra misam. 1577, 8vo.

ASCHARIANS, or ASCHARIOUNS, } the followers of Ascharius, a sect of Mahometans.

ASCHARIUS, a celebrated Mahometan Doctor.

ASCHERLEBEN, a town of Anhalt, seated on the river Eine, and built out of the ruins of the ancient ASCANIA.

ASCHIA, in ichthyology, the grayling.

ASCHIBOBUCH, a bird in Madagascar, which has been supposed to void Ambergris. See AMBERGRIS, § 1.

ASCHILLIUS, king of the Dacians, one of those monarchs, who is said to have assisted king Arthur in his wars.

(1.) ASCIA, in antiquity, an instrument supposed of the ax kind, used in the fabric of the Roman tombs and frequently represented on them. The *formula sub ascia dedicare*, is frequently found inscribed on ancient tomb stones. We also meet with *rogum ascia ne polsito* among the antique laws of the Twelve Tables.

(2.) ASCIA, in surgery, a kind of bandage, somewhat oblique, or crooked; whose form and use are described by Scultetus, in his *Armam. Chirug.*

ASCIBURGIUM, in ancient geography, supposed to be one of the 50 citadels built on the Rhine; is mentioned by Tacitus, who adds, some imagine it was built by Ulysses. Here was a Roman camp and a garrison. To its situation on the banks of the Rhine answers a small hamlet, now called ASBURG.

ASCIDIA, a genus of animals belonging to the order of vermes mollusca. The body is cylindrical, and fixed to a shell, rock, &c. It has two apertures; one on the summit, the other lower, forming a sheath. There are 6 species of this animal, viz.

1. ASCIDIA ECHINATA,
2. ASCIDIA GELATINOSUM,
3. ASCIDIA INTESTINALIS,
4. ASCIDIA PAPILLOSUM,
5. ASCIDIA QUADRIDENTATA,
6. ASCIDIA RUSTICA;

Only one of which, viz. the Rustica, (See *Plate* XIII. *fig.* 9.) is found in the British seas. Animals of this genus have the faculty of squirting out the water they take in.

The

The expanſion and contraction of other bodies occaſion their aſſuming various forms.

* ASCII. *n. ſ. It has no ſingular.* [from *α*, without, and *σκια*, a ſhadow.] Thoſe people who, at certain times of the year, have no ſhadow at noon; ſuch are the inhabitants of the torrid zone, becauſe they have the ſun twice a-year vertical to them. *Diſt.*

ASCINDOE, in botany, a name given by the people of Guinea to a ſhrub, which they uſe in medicine, boiling it in water, and giving the decoction in gonorrhœas, and the like complaints. Petiver has named it the *prickly Guinea ſhrub*, with roundiſh crenated leaves, and filamentous flowers. The leaves are about an inch wide, and about an inch and a half long: they ſtand on a ſhort foot ſtalk; and at the ends of the branches, there ſtand cluſters of ſtamineous flowers. The thorns on the large branches are very ſtrong.

(1.) ASCITÆ, [from *ασκος*, a bag, or bottle,] in antiquity, a ſect of Montaniſts, who appeared in the 2d century; ſo named, becauſe they introduced a kind of Bacchanals into their aſſemblies, who danced round a bag or ſkin blowed up; ſaying, they were thoſe new bottles filled with new wine whereof our Saviour makes mention, Matth. ix. 17.—They are ſometimes alſo called ASCONOGITÆ.

(2.) ASCITÆ, a tribe of Arabs. See ARABIA, § 5.

(1.) * ASCITES. *n. ſ.* [from *ασκος*, a bladder.] A particular ſpecies of dropſy; a ſwelling of the lower belly and depending parts, from an extravaſation and collection of water broke out of its proper veſſels. This caſe, when certain and inveterate, is univerſally allowed to admit of no cure but by means of the manual operation of tapping. *Quincy.*—There are two kinds of dropſy, the anaſarca, called alſo leucophlegmacy, when the extravaſated matter ſwims in the cells of the membrana adipoſa; and the *aſcites*, when the water poſſeſſes the cavity of the abdomen. *Sharp.*

(2.) ASCITES. See MEDICINE, *Index.*

* ASCITICAL. } *adj.* [from *aſcites.*] Belong-
* ASCITICK. } ing to an aſcites; dropſical; hydropical.—When it is part of another tumour, it is hydropical, either anaſarcous or *aſcitical. Wiſeman's Surgery.*

* ASCITITIOUS. *adj.* [*aſcititius*, Lat.] Supplemental; additional; not inherent; not original.—Homer has been reckoned an *aſcititious* name, from ſome accident of his life. *Pope.*

ASCLEPIA, a feſtival of Eſculapius the god of phyſic, obſerved particularly at Epidaurus, where it was attended with a conteſt between the poets and muſicians, whence it was likewiſe called *ἱερος ἀγων, the ſacred contention.*

ASCLEPIAD, in ancient poetry, a verſe compoſed of four feet, the firſt of which is a ſpondee, the 2d and 3d choriambuſes, and the laſt a pyrrhichius: or of 4 feet and a cæſura, the firſt a ſpondee, the 2d a dactyl, after which comes the cæſura, then the two dactyls; as

Māēcē|nās ătāvīs | ĕdīle rē|gĭbŭs.
O ĕt | prāĕ|fīdī|um | dūlcĕ dĕ|cūs mĕŭm.

(1.) ASCLEPIADES, a celebrated phyſician among the ancients, was a native of Pruſa, in Bithynia, and practiſed phyſic at Rome, about A. A. C. 96. He was the head of a new ſect: by preſcribing wine and cold water in the the ſick, acquired a very great reputation wrote ſeveral books, which are frequently tioned by Galen, Celſus, and Pliny; but the now loſt.

(2.) ASCLEPIADES, a famous phyſician Adrian, of the ſame city with the former. wrote ſeveral books concerning the compoſi medicines, both internal and external.

(1.) ASCLEPIAS, SWALLOW-WORT: A of the digynia order, belonging to the pen claſs of plants; and in the natural method under the 30th order, *Contortæ*. The ge character is taken from five oval, concave, like nectaria, which are found in the flower are 19 ſpecies, of which the following are remarkable, viz.

1. ASCLEPIAS ALBA, or common ſwallow has a root compoſed of many ſtrong fibr nected at top like thoſe of aſparagus, from arife many ſtalks, in number proportional ſize of the root, which grow two feet high are very ſlender at the top: the leaves are oppoſite by pairs; the flowers are white, in umbels near the top of the ſtalk, from are ſent out ſmaller umbels. After the flow paſt, the two germens become long pointed incloſing many compreſſed ſeeds lying imbri which are crowned with a ſoft white down. flowers in June, and the ſeeds ripen in Sept It is a native of the S. of France, Spain, and

2. ASCLEPIAS CURASSAVICA, or Indian cacuanha, is a native of the warm parts of A rica. It riſes to the height of 5 or 6 feet upright ſtems, and ſmooth oblong leaves oppoſite. Toward the top of the branch umbels of flowers come out, which ſtand the petals of the flowers are of a ſcarlet and the horny nectariums in the middle of bright ſaffron colour, which make a pretty ance; and there is a ſucceſſion of flowers ſame plant from June to October. The ſeed are ſucceeded by long taper pods, filled with crowned with a ſoft down, which ripen autumn. This ſpecies is tender, and muſt be ſerved in a ſtove.

3. ASCLEPIAS SYRIACA, or greater Syrian bane, is a perennial plant, which ſends upright ſtalks in the ſpring, about two feet garniſhed with oval leaves growing oppoſite top of the ſtalks the umbels of flowers are duced, which are a bright purple colour, a pretty appearance, but are not ſucceeded in England.

(4.) ASCLEPIAS, MEDICINAL USES, &c. THE. The root of the firſt ſpecies is uſed dicine. It is reckoned by botaniſts a ſpe dogſbane; from all the poiſonous ſorts may be diſtinguiſhed, by its yielding a limpid whilſt that of the other is milky. The ſtrong ſmell, eſpecially when freſh, ap to that of a valerian, or nard; the taſte ſweetiſh and aromatic, but ſoon becomes ſubacrid and nauſeous. This root is emeto dorific, diuretic, and emmenagogue, frequently employed by the French and Ge

phyſicians as an alexipharmic and ſometimes as a ſuccedaneum to contrayerva, whence it has received the name of *contrayerva Germanorum*. Among us it is very rarely made uſe of: it appears from its ſenſible qualities to be a medicine of much the ſame kind with valerian, which is indiſputably preferable to it. The root of the third ſpecies has been ſometimes ſent over from America inſtead of that of ipecacuanha, and miſchievous effects have been produced by it. Thoſe who cultivate this plant ought to be careful that none of its milky juice mix with any thing which is taken inwardly.

ASCLEPIODORUS, a Britiſh prince who flouriſhed in the 3d century. He killed Alectus, the Roman general, who had ſlain the celebrated Carauſius; and was elected king of the Britons, A. D. 232. He beſieged and took London from the Romans, and threw Livius Gallus the Roman general into a brook, which thence got the name of *Gallbrook*, ſince changed into WALLBROOK. He was at laſt ſlain by Coilus II. king of the Britons, A. D. 260.

ASCODRIGILES, the ſame with ASCODUTÆ.

ASCODROGITÆ. See ARCITÆ, N° 1.

ASCODUTÆ, in church hiſtory, a ſect of Chriſtians, in the 2d century, who rejected all uſe of ſymbols and ſacraments, on this principle, that incorporeal things cannot be communicated by things corporeal, nor divine myſteries by any thing viſible.

ASCOGEPHYRUS, in writers of the middle age, a bridge ſupported on bags made of leather, or bullocks hides. Such bridges appear to have been in uſe among the ancients, and to have given the denomination to a tribe of Arabs, hence called ASCITÆ: See N° 2. See alſo ASCOMANNI.

(1.) ASCOLI, anciently called ASCULUM PICENUM, a pretty large and populous town of Italy, in the marquiſate of Ancona, and territory of the church. It is a biſhop's ſee, and ſeated on a mountain, between the rivers Fronto and Caſtellano, 40 miles ſouth of Ancona. Lon. 15. 5. E. Lat. 42. 17. N.

(2.) ASCOLI DI SATRIANO, formerly called ASCULUM APULUM, a city of Naples, in the Capitanata, with a biſhop's ſee under the Archbiſhop of Benevento, 70 miles E. of Naples, and 30 W. of Manfredonia. Lon. 16. 30. E. Lat. 41. 15. N.

ASCOLIA, in Grecian antiquity, a feſtival celebrated by the Athenian huſbandmen in honour of Bacchus, to whom they ſacrificed a he goat, becauſe that animal deſtroys the vines; and, to ſhow the greater indignity to an animal hated by Bacchus, the peaſants, after having killed him, made a foot-ball of his ſkin. Virgil has deſcribed the occaſion of the ſacrifice, and manner of celebrating the feſtival, *Georg.* ii. 380.

ASCOLIASM, in antiquity, one of the games played at the ASCOLIA, wherein the young peaſants kept themſelves always on one foot, whilſt the other was ſuſpended in the air, and by their frequent falls, gave diverſion to the ſpectators. He that held the ſport longeſt, and made the largeſt hops, was the conqueror.

ASCOMANNI, pirates who uſed bridges or boats made of leather.

ASCONIUS PEDIANUS, an ancient grammarian of Padua, and according to Servius, an acquaintance of Virgil's. He wrote commentaries on Cicero's Orations, fragments of which are publiſhed in ſeveral editions of Cicero's works.

ASCOUGH, William, L. L. D. was appointed biſhop of Saliſbury in 1438, and ſoon after confeſſor to king Henry VI. About 12 years afterwards he was murdered by the famous rebel Jack Cade and his followers, who after plundering his carriage, fell upon him the next day, while he was officiating at the altar, in Edington, Lincolnſhire, and dragging him to a neighbouring hill, daſhed out his brains, on the 29th June, 1450.

ASCRA, a village of ancient Greece near mount Helicon, the birth place of the poet Heſiod.

* ASCRIBABLE. *adj.* [from *aſcribe.*] That which may be aſcribed.—The greater part have been forward to reject it, upon a miſtaken perſuaſion, that thoſe phœnomena are the effect of nature's abhorrence of a vacuum, which ſeem to be more fitly *aſcribable* to the weight and ſpring of the air. *Boyle.*

* *To* ASCRIBE. *v. a.* [*aſcribo*, Lat.] 1. To attribute to as a cauſe.—To this we may juſtly *aſcribe* thoſe jealouſies, and encroachments, which render mankind uneaſy to one another. *Rogers.* 2. To attribute as a quality to perſons, or accident to ſubſtance.—Theſe perfections muſt be ſomewhere, and therefore may much better be *aſcribed* to God, in whom we ſuppoſed all other perfections to meet, than to any thing elſe. *Tillotſon.*

ASCRIPTI, or ADSCRIPTI, in antiquity, thoſe who entered their names in the colonies, and became COLONI.

* ASCRIPTION. *n. ſ.* [*aſcriptio*, Lat.] The act of aſcribing. *Diſt.*

(1.) ASCRIPTITII, or ADSCRIPTITII, in ancient barbarous cuſtoms, were a kind of villains, who coming from abroad, ſettled in the lands of ſome new Lord, whoſe ſubjects or ſervants they commenced; being ſo annexed to the lands, that they might be transferred and ſold with them. Aſcriptitii is ſometimes alſo uſed in ſpeaking of aliens or foreigners newly admitted to the freedom of a city or country.

(2.) ASCRIPTITII was uſed in the military laws for the recruits to ſupply the legions, called alſo ACCENSI.

* ASCRIPTITIOUS. *adj.* [*aſcriptitius*, Lat.] That which is aſcribed. *Diſt.*

ASCRIPTIVI, the ſame with ASCRIPTITII.

ASCRIVIUM, in ancient geography, a town of Dalmatia, on the Sinus Rhizicus, now called CATTARO, the capital of the territory of Cattaro, in Venetian Dalmatia. Lon. 19. 20. E. Lat. 45. 25. N.

(1.) ASCULUM APULUM, in ancient geography, a town of Apulia, mentioned in the war with Pyrrhus, by Florus and Plutarch; now called ASCOLI. See N° 2.

(2.) ASCULUM PICENUM, in ancient geography, the capital of the Piceni, mentioned by Cæſar, Florus, &c. and now called ASCOLI.

ASCUS, in natural hiſtory, a word uſed by De Laet, for the pouch or bag which nature has given the opoſſum, for receiving its young ones in time of danger. This *aſcus* is a ſkinny bag, ſeparate from the reſt of the body, but adhering by a membrane to the bottom of the belly.

ASCYRUM,

ASCYRUM, PETER'S WORT: A genus of the polyandria order, belonging to the polyadelphia claſs of plants; and in the natural method ranking under the 20th order, Rotaceæ. The calyx conſiſts of 4 leaves; the corolla has 4 petals; the filaments are numerous, and divided into 4 bundles. There are 3 ſpecies; viz.

1. ASCYRUM CRUX ANDREÆ,
2. ASCYRUM HYPERICOIDES,
3. ASCYRUM VILLOSUM,

all natives of the Weſt Indies or America, but poſſeſſing no property hitherto diſcovered.

ASDHAS, a river of Turkey in Europe.

ASDRUBAL, the name of ſeveral Carthaginian generals. See CARTHAGE.

ASED-ABAD. See ASAD-ABAD.

ASEER, or ASEERGUR, a ſtrong fort of the Soubah of Candeiſh, in Deccan, 20 miles NE. of Burhampour. Lon. 76. 0. E. Lat. 21. 35. N.

ASEKAI, ASEKI, the name which the Turks give to the favourite ſultaneſſes who have brought forth ſons. Theſe are greatly diſtinguiſhed above others, in their apartments, attendants, penſions, and honours. They have ſometimes ſhared the government. The ſultana who firſt preſents the emperor with a male child, is reckoned the chief favourite, is called *buyuk aſeki*, and ranks as a legitimate wife: though, from the time of Bajazet I. the ſultans are forbid to marry by a public law, which Solyman II. broke through for the ſake of Roxalana.

ASELELAPPMARK. See ANGERMANNSLAND.

(1.) ASELLI, in aſtronomy, two fixed ſtars of the 4th magnitude, in the conſtellation Cancer.

(2.) ASELLI, in entomology, is uſed for millepedes.

ASELLUS, in zoology, a ſpecies of oniſcus. See ONISCUS.

ASEMUS, [from *a* negative, and *σημα*, a ſign,] is an epithet applied to events that fall out contrary to all appearance, and without any manifeſt cauſe.

ASENATH, the daughter of Potipherah, prieſt or prince of On, and wife of Joſeph, prime miniſter to Pharaoh king of Egypt; who ſeems to have made up the marriage, as it is ſaid he *gave* her to the patriarch: Gen. xli. 45. Some authors ſuppoſe Potipherah to be the ſame with Potiphar; and that Aſenath had endeared herſelf to Joſeph, by taking his part in his adverſity, and vindicating him to her father, againſt her laſcivious mother's calumny; which is indeed extremely probable.

ASEPTA, in medicine, [from *a* negative, and *σηπω*, to putrefy,] ſignifies any thing unputrefied, or unconcocted.

ASGARTH FORCE, a cataract on the Tees, which divides Durham from Yorkſhire, a few miles W. of Bernard's Caſtle, where the river falls down a precipice, 23 yards perpendicular, with prodigious force.

ASGILL, John, a late humorous writer, was bred to the law, and practiſed in Ireland with great ſucceſs. He was there elected a member of the houſe of Commons, but was expelled for writing a Treatiſe on *the Poſſibility of avoiding Death*; and being afterwards choſen a member for the borough of Bramber in Suſſex, he was alſo on the ſame account expelled the parliament of England. After this, he continued 30 years a priſoner in the Mint, Fleet, and King's Bench; during which time he publiſhed a multitude of ſmall political pamphlets, ſeveral of which were in defence of the ſucceſſion of the houſe of Hanover, and againſt the Pretender. He died in the King's Bench, in 1738, aged above 80.

(1.) * ASH. *n. ſ.* [*fraxinus*, Lat. *æſc*, Saxon] 1. A tree.—This tree hath pennated leaves, which end in an odd lobe. The male flowers, which grow at a remote diſtance from the fruit, have no petals, but conſiſt of many ſtamina. The ovary becomes a ſeed veſſel, containing one ſeed at the bottom, ſhaped like a bird's tongue. *Miller.* 2. The wood of the aſh.—

Let me twine
Mine arms about that body, where againſt
My grained *aſh* an hundred times hath broke,
And ſcar'd the moon with ſplinters. *Shakeſp.*

(2.) ASH, in botany. See FRAXINUS.

* ASHAMED. *adj.* [from *ſhame*.] Touched with ſhame; generally with *of* before the cauſe of ſhame if a noun, and *to* if a verb.—Profeſs publickly the doctrine of Jeſus Chriſt, not being *aſhamed of* the word of God, or *of* any practice enjoined by it. *Taylor's Holy Living.*—

One wou'd have thought ſhe wou'd have ſtirr'd; but ſtrove
With modeſty, and was *aſham'd to* move. *Dryd.*

ASHBORN, or ASBORN, a town in Derbyſhire, on the borders of Staffordſhire, ſeated between the rivers Dove and Compton, 10 miles from Derby, 10 NE. from Utoxeter, and 151 NNW. from London. It has a ſtone bridge over the Dove. It is large and populous, though not ſo flouriſhing as formerly. It has 7 fairs, on the 13 Feb. 3 April, 5 July, 21, May, 15 Auguſt, 11 Oct. and 29 Nov. and a market on Saturday. Its chief trade is in cheeſe. Lon. 1. 44. W. Lat. 53. 3. N.

ASHBRIGHT, a village in Devonſhire.

ASHBRITTLE, a ſmall town in Somerſetſhire.

ASHBURN, a river in Suſſex, which falls into the ſea at Pevenſey.

(1.) ASHBURNHAM, a poſt town of the United States, in Worceſter county, Maſſachuſetts, on the W. ſide of the river Sowhegan, 60 miles NW. of Boſton, and 402 from Philadelphia. Lon. 3. 8. E. Lat. 42. 37. N.

(2.) ASHBURNHAM, a town in Suſſex, 9 miles from Haſtings, and 51 from London.

ASHBURTON, a town in Devonſhire, ſeated on the river Dart, 10 miles from Totneſs, 195 SW of Exeter, and 192 W. by S. of London. It carries on a conſiderable trade, in wool, yarn, ſerges; has markets on Tueſday and Saturday, and fairs on 1ſt Thurſday of March and June, 26 on 10 Aug. and 11 Nov. It ſends two members to parliament, and is one of the four ſtanary towns. It is ſeated among the hills, which are bound in tin and copper; and has a very handſome church, with a chapel, which is turned into a ſchool. Lon. 3. 50. W. Lat. 50. 30.

ASHBY-CASTLE, a ſmall town in Northamptonſhire, 6 miles from Northampton and Wellingborough.

ASHBY-COLD, a ſmall town in Northamptonſhire, 2 miles NW. of Naſeby.

ASHBY-DE-LA-ZOUCH, a town in Leicestershire, so called from the Zouches, its ancient Lords, 13 miles S. of Derby, 15 from Leicester, and 115 from London. It has 7 fairs, viz. on Easter Tues. Whitsun. Tues. 24 Aug. 2 Sept. St Simon's and St Jude's days, and 28 Oct. and is stocked with excellent horses. It had a castle which was long in the possession of the family de la Zouch. It afterwards fell into the hands of Edward IV. who granted it to Sir Edward Hastings, with the title of a baron, and licence to make a castle of the manor house, to which he adjoined a very high tower. It was demolished in 1648; but a great part of the tower is still standing. It now belongs to the earl of Huntingdon. Lon. 0. 52. W. Lat. 52. 4. N.

* ASH-COLOURED. *adj.* [from *ash* and *colour.*] Coloured between brown and grey, like the bark of an ashen branch.—Clay, *ash-coloured*, was part of a stratum which lay above the strata of stone. *Woodward on Fossils.*

ASHDOD, or AZOTUS. See AZOTUS.

ASHDOWN, 1. a small town in Berkshire, near E. Ilsley 2. a place in Essex, anciently called ASSANDUM, or the hill of ashes, famous for the defeat of Edmund Ironside by Canute the Dane.

ASHE-BIGOD, or ASHE-BOCKING, } a small town in Suffolk, near Bradley and Needham.

ASHELE, a small town in Norfolk between Watton and Swaffham.

* ASHEN. *adj.* [from *ash.*] Made of ash wood.

At once he said, and threw
His *ashen* spear; which quiver'd as it flew. *Dryd.*

ASHENHURST, a small town in Staffordshire, SE. of Leek.

ASHEPOO, a river of S. Carolina, which rises in Charlestown district, and running S. by E. enters St Helena Sound by two channels, on the W. side of Penwick's Island. It is navigable by boats for 10 or 12 miles.

(1.) ASHER, [אשר, Heb. *i. e.* blessedness;] one of Jacob's sons by Zilpah, and the progenitor of the tribe so called. See N° 2.

(2.) ASHES, a numerous tribe of the Israelites, who possessed a fertile region in the NW. of Canaan; but whose courage was not proportionate to their numbers, as they suffered the Canaanites, whom they were commanded to extirpate, to retain many cities in their neighbourhood, and tamely submitted to the oppressions of the Canaanitish tyrant, Jabin. They, however, assisted Gideon, in his pursuit of the Midianites; 40,000 of them, expert warriors, attended David at his coronation, and many of them joined Hezekiah, in his reform.

(1.) * ASHES. *n. s. wants the singular.* [*æsca*, Sax. *æsche*, Dutch.] 1. The remains of any thing burnt.—*Ashes* contain a very fertile salt, and are the best manure for cold lands, if kept dry, that the rain doth not wash away their salt. *Mortimer.*

2. The remains of the body; often used in poetry for the carcase, from the ancient practice of burning the dead.—

Poor key-cold figure of a holy king!
Pale *ashes* of the house of Lancaster! *Shak.*

(2.) ASHES, among the ancient Persians, were used as an instrument of punishment for some great criminals. The criminal was thrown headlong from a tower 50 cubits high, which was filled with ashes to a particular height, (2 Mac. xiii. 5, 6.) The motion which the criminal used to disengage himself from this place, plunged him still deeper into it, and this agitation was farther increased by a wheel which stirred the ashes continually about him till at last he was stifled.

(3.) ASHES, in chemistry, the earthy particles of combustible substances after they have been burnt. If the ashes are produced from vegetable bodies, they contain a considerable quantity of fixed salt, blended with the terrene particles: and from these ashes the fixed alkaline salts called *pot-ash*, *pearl-ash*, &c. are extracted. See POTASH, &c. The ashes of all vegetables are vitrifiable, and found to contain iron.—They are also an excellent manure for cold and wet grounds. See HUSBANDRY, *Index.*

(4.) ASHES were anciently used in several religious ceremonies. St Jerome relates, that the Jews in his time rolled themselves in ashes, as a sign of mourning. To repent in sackcloth and ashes, is a frequent expression in Scripture for mourning and being afflicted for our sins. There was a sort of lye and lustral water made with the ashes of an heifer sacrificed upon the great day of expiation; the ashes whereof were distributed to the people, and this water was used in purifications as often as any touched a dead body, or was present at funerals, (Numb. xix. 17.) Tamar, after the injury received from her brother Amnon, covered her head with ashes, (2 Sam. xiii. 19.) The Psalmist says, that he had eaten ashes as bread, (Psal. cii. 9.) which, however, is to be considered as an hyperbolical simile. He sat on ashes, he threw ashes on his head; his food, his bread, was spoiled with the ashes wherewith he was covered.

ASH-FIRE, among chemists, a fire, wherein the vessel to be heated is covered with ashes or sand.

ASHFORD, a town of Kent, 12 miles SW. of Canterbury, 24 SE. of Maidstone, and 57 SE. by E. from London, in the road to Hith. It has a monument for a countess of Athol near 400 years old. It has fairs on 17 May and 9 Septem. Lon. 0. 52. E. Lat. 51. 4. N.

ASH HOLE, among chemists, is the lowest part of a furnace; and is intended to receive the ashes falling from the fire, and to give a passage to the air which is to be introduced into the furnace, to keep up the combustion.

ASHI, a prince of Norway, slain by Fingal, the father of Ossian, at a place of Inverness-shire, ever since, named *Drumashi*, or ASHI'S HILL.

ASHILL, a village in Somersetshire, 2 miles from Ilminster, and 5 from Taunton. Its fairs are on Easter Wednesday, and 1st Wed. after 8 Sept.

ASHIMA, an idol of the Samaritans, (2 Kings xvii. 30.) said to have been formed like a lion, or a goat, and to have represented the sun.

ASHINGTON, a village in Sussex, 10 miles from Horsham, which has a fair on 2d July.

ASHI'S HILL. See ASHI.

ASHKENAZ, the eldest son of Gomer, and grandson of Japhet; said to have been the progenitor of the Germans, and Phrygians.

ASHKIRK, a parish of Scotland, situated in the counties of Roxburgh and Selkirk, but chiefly in the former; 7 miles in length and 3 in breadth.

By Mr Haliburton, the minister's report to Sir J. Sinclair, it contained 539 souls, in 1792, which was 90 fewer than it had in 1755. The rent of land, however, had increased about a fourth within 15 years preceding 1792. The number of horses was 140, and that of black cattle 442. The parish is hilly, but the hills are green to their tops, and the soil is light and partly spongy. It is watered by the river Ale, and by 12 lakes, 4 of which are entirely within its bounds.

* ASHLAR. *n. s.* [with masons.] Free stones as they come out of the quarry, of different lengths, breadths, and thicknesses.

* ASHLERING. *n. s.* [with builders.] Quartering in garrets, about two foot and a half or three foot high, perpendicular to the floor, and reaching to the underside of the rafters. *Builder's Dict.*

ASHLEY, Robert, author of several works, and translator of more, was born in 1565, descended of an ancient family residing at Nash-hill in Wiltshire, and flourished about the end of the 16th and beginning of the 17th century. He was admitted at Hart Hall in Oxford, in 1580, and afterwards at the Middle Temple as a Barrister. He travelled through Holland, France, &c. and corresponded with most of the literati of that age. He died in 1641.

ASHLING, EAST, } two villages in Sussex,
ASHLING, WEST, } near Chichester. They have a fair 21st July.

ASHLINGTON, a small town in Wiltshire.

ASHLY, a river of S. Carolina, which rises in Charleston district, and after running SSW. for 20 miles, turns gradually SSE. passes by Dorchester, and falls in Charleston harbour, E. of the town. It is navigable by boats for several miles.

ASHMANSWORTH, a small town in Hampshire, W. of Sidmanton.

ASHMOLE, Elias, a great antiquary and herald, founder of the Ashmolean museum at Oxford, was born at Litchfield in Staffordshire, 1617. In the early part of his life, he practised in the law; and in the civil war had a captain's commission, and also comptroller of the ordnance, under Charles I. He married lady Mainwaring in 1649, and settled at London; where his house was frequented by most of the learned men of the age. Mr Ashmole was a diligent collector of manuscripts. In 1650, he published a treatise written by Dr Arthur Dee, relating to the philosopher's stone; with another tract on the same subject, by an unknown author. About the same time, he was busied in preparing for the press a complete collection of the works of such English chemists as had till then remained in manuscript. This undertaking cost him great labour and expence; and at length the work appeared, towards the close of the year 1652. He proposed at first to have carried it on to several volumes; but he afterwards dropped this design, and applied himself to the study of antiquity and records. He was at great pains to trace the Roman road, which in Antoninus's Itinerary is called BENNEVANNA, from Weedon to Litchfield, of which he gave Mr Dugdale an account in a letter. In 1658, he began to collect materials for his history of the order of the garter, which he lived to finish. In September following, he made a journey to Oxford, where he set about giving a full and particular description of the coins presented to the public library by Archbishop Laud. Upon the restoration, Mr Ashmole was introduced to king Charles II. who bestowed on him the place of Windsor herald. Soon after, he appointed him to give a description of his medals, which were accordingly delivered into his possession, and King Hen. VIII's closet was assigned for his use. Mr Ashmole was afterwards admitted a fellow of the royal society; and the king appointed him secretary of Surinam, in the West Indies. On the 19th July 1669, the university of Oxford, in consideration of the many favours they had received from Mr Ashmole, created him M. D. by diploma, which was presented to him by Dr Yates, principal of Brazen-Nose college. On the 8th of May 1672, he presented his "Institution, laws, and ceremonies of the order of the garter," to the king; who as a mark of his approbation, granted him 400 l. out of the custom of paper. On the 26th of January 1679, a fire broke out in the Middle Temple, in the next chamber to Mr Ashmole's, by which he lost a noble library, with a collection of 9000 coins, ancient and modern, and a vast repository of seals, charters, and other antiquities and curiosities; but his manuscripts and his most valuable gold medals were luckily at his house at Lambeth. In 1683, the university of Oxford having finished a magnificent repository near the theatre, Mr Ashmole sent thither his collection of rarities; which benefaction was augmented by the addition of his manuscripts and library at his death, which happened at Lambeth, May 18, 1692, in the 76th years of his age. Besides the works above mentioned, Mr Ashmole left several which were published since his death, and some which remain still in manuscript.

ASHMOLEAN MUSÆUM. See last article.

ASHMORE-BROOKE, a small town in Staffordshire, near Litchfield.

* ASHORE. *adv.* [from *a* and *shore*.] 1. On shore; on the land.—The poor Englishman riding in the road, having all that he brought thither *ashore*, would have been undone. *Raleigh*. 2. To the shore; to the land.—

We may as bootless spend our vain command,
As send our precepts to the leviathan
To come *ashore*. *Shakesp. Hen. V.*

ASHOVER, a village in Derbyshire, near Milltown and the Amber, which has fairs, 25 April and 15 October.

ASHPENAZ, the governor of Nebuchadnezzar's eunuchs. See Dan. i. 3.

ASHPRINGTON, a small town in Devonshire, N. of the Hareborn, where it joins the Dart.

ASHRIDGE, a small town of Hertfordshire, 3 miles from Berkhampstead.

ASHTAROTH, ASHTORETH, [עשתרות, Heb. i. e. flocks, or riches,] or ASTARTE, the chief goddess of the Sidonians and Phœnicians, called also the Queen of Heaven, and reckoned the same with the Juno of the Greeks and Romans. Cicero, however, calls her the Venus of Syria, wherein he is certainly justified by her mode of worship; which, like that of the Grecian Venus, abounded in all manner of debauchery. The Israelites in all their relapses to idolatry showed a great

fondneſs for her worſhip. Solomon himſelf in his dotage ſacrificed to her. It muſt indeed be owned, it was at leaſt more *natural* than the cruel and murderous worſhip of Moloch. But it is aſtoniſhing that any *female* ſovereign ſhould have had the impudence to patronize it; which, however, was openly done by Ahab's *chaſte* queen, Jezebel, who appointed 400 prieſts for her ſervice. She was repreſented in various habits, encircled with rays, &c. Her worſhip appears to have been very ancient, as we find a place named after her in the days of Abraham. Aſhtaroth was alſo worſhipped by the Philiſtines, in whoſe mythology ſhe was ranked as the ſiſter of Dagon. See next article.

ASHTAROTH-KARNAIM, an ancient city of the Canaanites, famous for Chedorlaomer's victory over the Rephaims, (Gen. xiv. 5.) as well as for being the reſidence of Og king of Baſhan. (Deut. i. 4.) It was ſituated ſix miles from Edrei, E. of Jordan; and fell to the lot of the half tribe of Manaſſeh.

(1.) ASHTON, Charles, a great antiquarian and one of the moſt learned critics of his age, was elected Maſter of Jeſus College, Cambridge, July 5th 1701, and inſtalled prebend of Ely, on the 14th. His ſkill in eccleſiaſtical antiquities was equalled by few and excelled by none; as his remarks on the fathers, and corrections of the miſtakes of tranſlators evidence.

(2.) ASHTON, Dr Thomas, a native of Eton, ſtudied at Cambridge, in 1733, was ſucceſſively rector of Aldingham, Starminſter, and St Botalph, Biſhopſgate. In 1759 he took his degree of D. D. married Miſs Amyand, in 1760, and in May 1762 was elected preacher at Lincoln's Inn, which he reſigned in 1764. He died in 1775, aged 59. His diſcourſes were admirable and his delivery excellent. He publiſhed, 1. A volume of Sermons; 2. a Diſſertation on II. Peter. i. 19.—3. A letter to the Revd. Mr Jones. 4 & 5. Two Letters to Dr Morell, on electing aliens into places in Eton College; and 6. An Extract from the caſe of the obligation of electors, &c.

(3.) ASHTON UNDER LINE, a village of England, 6 miles from Mancheſter, ſeated on the Taume. It has fairs Aug. 5, and Dec. 3.

ASHUELOT, a river of the United States, in New Hampſhire, formed by a great number of ſtreams which flow from ponds in Cheſhire county, and unite at Swanſy; when running SW. it falls into Connecticut river, 4 miles N. of Maſſachuſetts.

ASHUR, [אשור, Heb. *i. e.* bleſſed,] the ſon of Shem, and progenitor of the Aſſyrians.

ASHURIM, or ASHURITES, } The ancient Aſſyrians, ſo called in Scripture,

* ASHWEDNESDAY. *n. ſ.* The firſt day of Lent, ſo called from the ancient cuſtom of ſprinking aſhes on the head.

* ASHWEED. *n. ſ.* [from *aſh* and *weed*.] An herb.

ASHWELL, George, rector of Hanwell, ſon of Robert Aſhwell of Harrow, was born at London, in 1612, and admitted in Wadham College, Oxford, in 1627, where he took his degrees of A. M. and B. D. and was elected a fellow and tutor. During the rebellion he preached ſeveral times before the king and parliament. He died at Hanwell, in 1691, with the character of a religious, learned, and peaceable divine. He wrote, 1. A Diſcourſe, aſſerting the received authors, and authority of the Apoſtles Creed. Oxon. 1653. 2. A double Appendix, touching the Athanaſian and Nicene Creeds. 3. On the Geſture at receiving the Sacrament. 1663. 4. A Treatiſe concerning Socinus, and the Socinian Hereſy. 5. A Diſſertation on the Church of Rome. Ox. 1688. And an anſwer to Plato Redivivus; beſides tranſlations.

ASHWICK, a ſmall town in Somerſetſhire, near Kilmerſden.

ASHWORTH CHAPEL, a ſmall town in Lancaſhire, W. of Rochedale.

* ASHY. *adj.* [from *aſh*.] Aſh-coloured; pale; inclining to a whitiſh grey.—

Oft have I ſeen a timely parted ghoſt
Of *aſhy* ſemblance, meagre, pale, and bloodleſs. *Shakeſp.*

(I. 1.) ASIA, BOUNDARIES AND EXTENT OF. Aſia is one of the three general diviſions of our continent, and one of the four of the whole earth. It is ſeparated from Europe by the Mediterranean ſea, the Archipelago, the Black Sea, the Palus Meotis, the Don, and the Dwina, which fall into the White Sea; and from Africa, by the Arabic Gulph, or Red Sea, and the Iſthmus of Suez. All the other parts are ſurrounded by the ocean. The late diſcoveries ſhow that it does not join to America, though it extends very near it. See AMERICA, § 2. It is ſituated between 44° and 196° lon. E. and 1° and 74° lat. N. From the Dardanelles to the moſt eaſtern ſhore of Tartary, it is 4740 miles in length; and from the moſt ſouthern point of Malacca to the moſt northern point of Nova Zembla, it is 4380 miles in breadth.

(2.) ASIA, DIVISIONS, &c. OF. Aſia may be divided into the following parts: Turky in Aſia, Arabia, Perſia, the Mogul's empire, with the two peninſulas of the Indies; Tibet, China, and Korea; Great and Little Buckaria, with Koraſm; Tartary, Siberia, and the iſlands. The principal languages ſpoken in Aſia are, the modern Greek, the Turkiſh, the Ruſſian, the Tartarian, the Perſian, the Arabic, the Malayan, the Chineſe, and the Japaneſe. The European languages are alſo ſpoken upon the coaſts of India and China. Aſia is looked upon as that part of the world which, of all others, has been moſt peculiarly diſtinguiſhed by heaven. There it was the firſt man was created; there the patriarchs lived, the law was given to Moſes, and the greateſt and moſt celebrated monarchies were formed; from thence the firſt founders of cities and nations in other quarters of the world brought their colonies. Laſtly, in Aſia Jeſus Chriſt appeared: there it was that he wrought the ſalvation of mankind, that he died and roſe again; and from thence it is that the light of the goſpel was diffuſed over all the world. Laws, arts, ſciences, and religion, almoſt all had their original in Aſia.

(3.) ASIA, GOVERNMENT, AND RELIGIONS OF. This vaſt extent of territory was ſucceſſively governed in paſt times by the Aſſyrians, the Medes, the Perſians, and the Greeks; but the immenſe regions of India and China were little known to

Alexander, or the conquerors of the ancient world. Upon the decline of thoſe empires, great part of Aſia ſubmitted to the Roman arms; and afterwards, in the middle ages, the ſucceſſors of Mahomet, or, as they are uſually called, Saracens, founded in Aſia, in Africa, and in Europe, a more extenſive empire than that of Cyrus, Alexander, or even the Roman when in its height of power. The Saracen greatneſs ended with the death of Tamerlane; and the Turks, conquerors on every ſide, took poſſeſſion of the middle regions of Aſia, which they ſtill enjoy. Beſides the countries poſſeſſed by the Turks and Ruſſians, Aſia contains at preſent three large empires, the Chineſe, the Mogul, and the Perſian; upon which the leſſer kingdoms and ſovereignties of Aſia generally depend. The prevailing form of government in this diviſion of the globe is abſolute monarchy. If any of them can be ſaid to enjoy ſome ſhare of liberty, it is the wandering tribes, as the Tartars and Arabs. Many of the Aſiatic nations, when the Dutch firſt came among them, could not conceive how it was poſſible for any people to live under any other form of government than that of a deſpotic monarch. Turkey, Arabia, Perſia, part of Tartary, and part of India, profeſs Mahometaniſm. The Perſian and Indian Mahometans are of the ſect of Hali, and the others of that of Omar; but both own Mahomet for their law-giver, and the Koran for their rule of faith and life. In the other parts of Tartary, India, China, Japan, and the Aſiatic Iſlands, they are generally heathens and idolaters. Jews are to be found every where in Aſia. Chriſtianity, though planted here with wonderful rapidity by the apoſtles and primitive fathers, ſuffered an almoſt total eclipſe by the conqueſts of the Saracens, and afterwards of the Turks. Incredible indeed have been the hazards, perils, and ſufferings of popiſh miſſionaries, to propagate their doctrines in the moſt diſtant regions, and among the groſſeſt idolators; but their labours have hitherto failed of ſucceſs, owing in a great meaſure to their own avarice, and the avarice and profligacy of the Europeans, who reſort thither in ſearch of wealth and dominion.

(4.) ASIA, ISLANDS OF. The Aſiatic iſlands are very numerous, inſomuch that ſome reckon 1500; but of this there is no certainty. However they may be divided into thoſe of the E. W. S. and S. E. Thoſe that lie on the E. of Aſia are, the iſlands of Jeſſo or Yedſo, and Japan, with ſeveral ſmall ones on the coaſt of Korea, the iſland Formoſa, and the Philippines. Thoſe on the W. are, the iſland of Cyprus, in the Mediterranean; Scanderoon, off Natolia, and the iſle of Rhodes, off Phiſchio, on the ſame coaſt. Thoſe on the S. are, the iſles of the Maldives, in the Indian Sea; the iſle of Ceylon, off cape Komorin; with a great many ſmall ones in the gulph of Bengal. Thoſe on the SE. are, the iſles of Sandi, as Sumatra, the iſles of Java, Borneo, &c. the Moluccas, the iſles of Kumbava, Timor, &c.

(5.) ASIA, RIVERS, LAKES, &c. OF. The chief rivers of Aſia are, the Euphrates and Tigris, in Turky; the Indus and Ganges, in India; the Kiang and Hoang-ho, in China; the Sir Amu and Wolga, in Weſtern Tartary; the Saghalia Ula or Amur, in Eaſtern Tartary; the Irtiſh, Oby, Jeniſea, and Lena in Siberia. The lakes are, that prodigious one called the *Caſpian Sea*; and near that another, very large one, but lately known to us, called *Aral*, or the lake of eagles. The Baykal is in Siberia, the Kokonor near Tibet, and the Tong Ping in China. The chief mountains are, the Taurus in Turky and Perſia; the Imaus, between India and Tibet; and the Altay, in Tartary.

(6.) ASIA, SOIL, PRODUCE, &c. OF. As Aſia exceeds the other two parts of our continent, Europe and Africa, ſo it is ſuperior to them in the ſerenity of its air, the fertility of its ſoil, the deliciouſneſs of its fruits, the fragrancy and balſamic qualities of its plants, ſpices, and gums; the ſalubrity of its drugs; the quantity, variety, beauty, and value of its gems; the richneſs of its metals, and the fineneſs of its ſilks and cottons. A great change indeed hath happened in that part of it called Turky, which hath loſt much of its ancient ſplendor, and from the moſt populous and beſt cultivated ſpot in Aſia, is become a wild and uncultivated deſart. The other parts of Aſia continue much in their former condition; the ſoil being as remarkable for its fertility, as moſt of the inhabitants for their indolence, effeminacy, and luxury. This effeminacy is chiefly owing to the warmth of the climate, though in ſome meaſure heightened by cuſtom and education; and the ſymptoms of it are more or leſs viſible as the ſeveral nations are ſeated nearer or farther from the north. Hence the Tartars, who live near the ſame latitudes with us, are as brave, hardy, ſtrong and vigorous, as any European nation. What is wanting in the robuſt frame of their bodies among the Chineſe, Mogul-Indians, and all the inhabitants of the more ſouthern regions, is in a great meaſure made up to them by the vivacity of their minds, and ingenuity in various kinds of workmanſhip, which our moſt ſkilful mechanics have in vain endeavoured to imitate.

(II.) ASIA MINOR, or LESSER ASIA; the ſame with Natolia. See NATOLIA.

ASIARCHÆ were the Pagan Pontiffs of Aſia, choſen to ſuperintend the public games; which they did at their own expence; and therefore they were always choſen from among the richeſt and moſt conſiderable men of the towns. They are mentioned by St Paul, Acts xix. 31, where they are ſtiled the chiefs of Aſia.

ASIATIC, *adj.* any thing produced in Aſia.

ASIATICS, the natives of ASIA. See § 3. 4.

(1.) * ASIDE. *adv.* [from *a* and *ſide*.] 1. To one ſide; out of the perpendicular direction.—

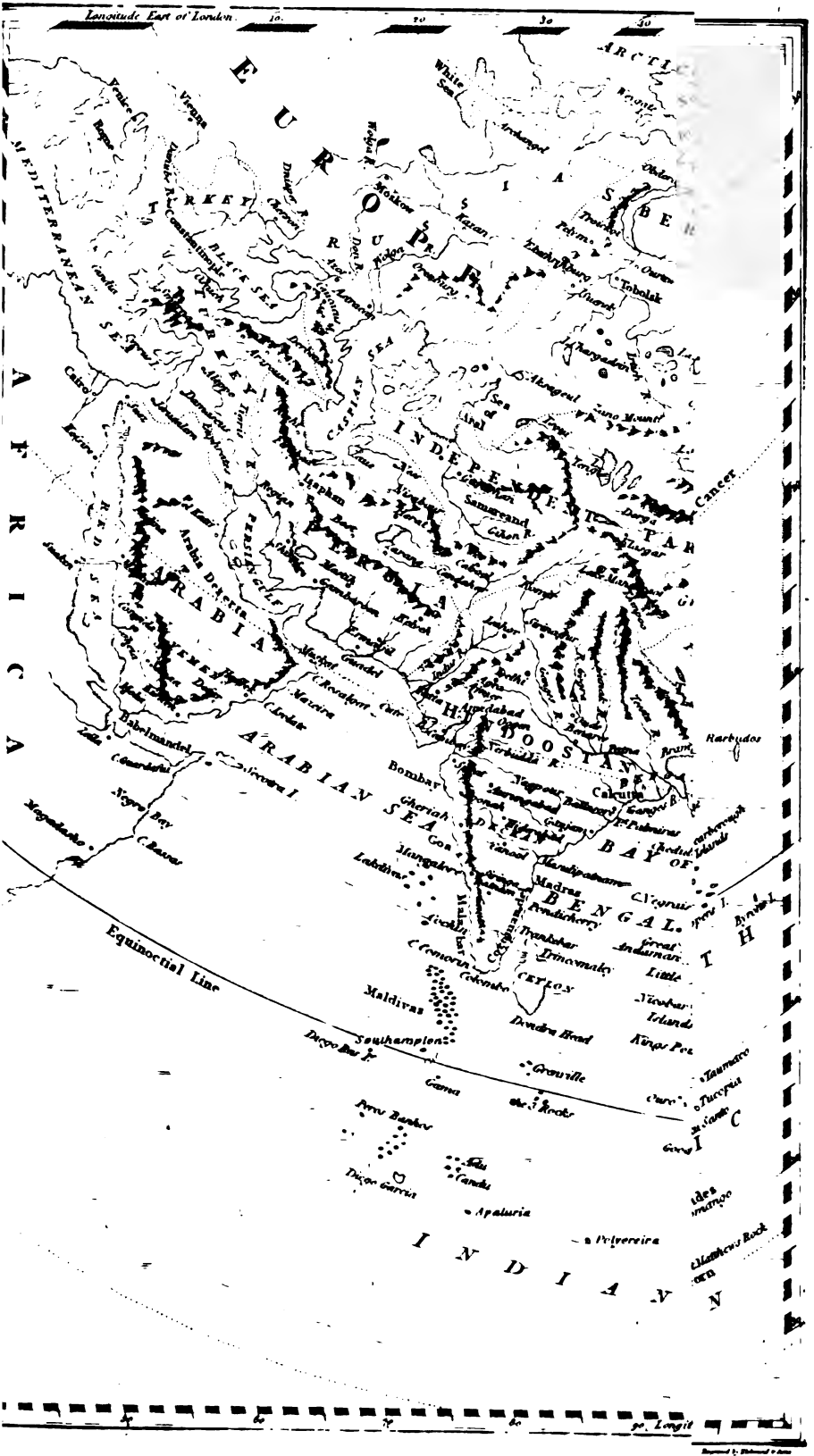
The flames were blown *aſide*, yet ſhone they bright,
Fann'd by the wind, and gave a ruffled light.
Dryden

2. To another part; out of the true direction.—He had no brother; which though it be a comfortable thing for kings to have, yet it draweth the ſubjects eyes a little *aſide*. *Bacon*. 3. From the company; as, to ſpeak *aſide*.—He took him *aſide* from the multitude. *Mark* vii. 33.

(2.) ASIDE, in the drama, ſomething ſaid by an actor, which ſome, or even all the other actors preſent, are ſuppoſed not to hear; a circumſtance juſtly condemned as unnatural and improbable.

ASIICTOS. See ABSYNTHUS.

ASIITO-


Longitude East of London
10.
20
30
50
EUROPE
ASIA
AFRICA
INDIAN
ARCTIC
MEDITERRANEAN SEA
TURKEY
Constantinople
Black Sea
Caspian Sea
Aral
Cancer
Tropic of
ARABIA
Arabia Deserta
Arabia Petraea
Arabia Felix
Red Sea
Persian Gulf
Mecca
Medina
Jerusalem
Damascus
Aleppo
Cairo
Bombay
Surat
Goa
Calicut
Madras
Pondicherry
Ceylon
Maldivas
Equinoctial Line
Southampton
Granville
Rock
Apaluria
Polyvereira
Harbadoes
Tobolsk
Archangel
White Sea
Volga
Don R.
Dwina R.
Euphrates
Tigris
Nile
Indus
Ganges
Bay of Bengal
Arabian Sea
Persian Bay
Mozambique
Negro Bay
Cape Negro
Comorin
Labdives
Great Andaman
Little Andaman
Nicobar Islands
Nassau
Taumaco
Tucopia
Isles of Candia
Peru Bank
Diego Garcia
Diego Bay
Gama
Longit

wn of Italy, in Perugia, and in the
3. Lon. 23. 40. E. Lat. 43. 0. N.
, in entomology, the hornet fly,
s belonging to the order of inſecta
two wings; and a horny, ſtrait,
. There are 17 ſpecies of this in-
hem wound in a very painful man-
articularly troubleſome to cattle in
s; others of them are quite harm-
XIII. fig. 15.
in ornithology, the name uſed by
UTEOLA, or *regulus non criſtatus*, an
bird, common among willows.
an iſland on the NW. coaſt of Sar-
, 30. E. Lat. 41. 0. N.
an appellation given, by way of
the ancient Chriſtians, as well as
miſtaken opinion, among heathens,
ſhipped an aſs. The appellation
given to the Jews, and only became
Chriſtians: the Jews were charged
a golden aſs's head in the ſanctuary
, to which, on certain occaſions, they
n; in memory of a herd of aſſes,
ir paſſing through the wilderneſs,
the way, under a diſtreſſing want
a ſpring.
LY. *adj.* [*aſinarius*, Lat.] Belonging
ſs.
A, a town of Andaluſia.
A, in medicine, an immoveableneſs of
e in any part of it, as in apoplexy,

NE. *adj.* [from *aſinus*.] Belonging to
a ſhall have more ado to drive our
s, our ſtocks and ſtubs from ſuch nur-
ve have now to hale our choiceſt and
wits to that *aſinine* feaſt of ſow thiſtles
es, *Milton*.
S LAPIS, a name given by ſome wri-
middle ages, to a ſtone, ſaid to be
oſe places frequented by the wild aſs.
s.
POLLIO. See POLLIO.
s, [Lat. an aſs,] a ſpecies of EQUUS.
PISCIS, in ichthyology, a name given
thors to the *aegleſinus*, or common had-
ed alſo *onos*.
n ornithology, a name given by Aldro-
d others, to the *otus*, or leſſer horn owl.
GABER. See ESIONGABER.
, or ASSISIA, a town of Liburnia, now
ut exhibiting many monuments of an-
It is the Aſſeria or Aſſeſia of Pliny, and
ed PODGRAJE. See ASSERIA.
, or) a city of the Pope's territories in
O,) Italy, ſituated about 16 miles E.
a, and 80 N. of Rome. It is ſeated on
in, and is ſaid to have been the birth place
acis. Lon. 13. 35. E. Lat. 43. 10. N.
ASH, As, do all come from the Saxon
ſh tree. *Gibſon's Camden*.
To ASK. *v. a.* [*aſcian*, Saxon.] 1. To
to beg: ſometimes with an *accuſative*
metimes with *for*.—
hen thou doſt *aſk* me *bleſſing*, I'll kneel
own,
of thee *forgiveneſs*. *Shakeſpeare*.
—In long journeys, *aſk* your maſter *leave* to give
ale to the horſes. *Swift*. 2. To demand; to
claim: as, to *aſk* a price for goods.—*Aſk* me
never ſo much dowry and gift, and I will give
according as ye ſhall ſay unto me: but give
me the damſel to wife. *Geneſis*, xxxiv. 12. 3. To
queſtion.—O inhabitant of Aroer, ſtand by the
way and eſpy, *aſk* him that flieth, and her that
eſcapeth, and ſay, what is done? *Jeremiah*, xlviii.
19. 4. To enquire; with *after* before the thing.
—He ſaid, wherefore is it that thou doſt *aſk after*
my name? And he bleſſed him there. *Geneſis*,
xxxii. 29. 5. To require, as phyſically neceſſary.
—As it is a great point of art, when our matter
requires it, to enlarge and veer out all ſail; ſo to
take it in and contract it, is no leſs praiſe when
the argument doth *aſk* it. *Ben Jonſon*.

(2.) * *To* ASK. *v. n.* 1. To petition; to beg:
with *for* before the thing.—My ſon, haſt thou ſin-
ned? do ſo no more, but *aſk* pardon *for* thy for-
mer ſins. *Eccluſ.* xxi. 1. 2. To make enquiry;
with *for* or *of* before the thing. To enquire.—
Stand ye in the ways, and ſee, and *aſk for* the
old paths, where is the good way, and walk therein,
and ye ſhall find reſt for your ſouls. *Jerem.* vi. 16.
—For *aſk* now *of* the days that are paſt, which
were before thee, ſince the day that God created
man upon the earth, and *aſk* from the one ſide of
heaven unto the other, whether there hath been
any ſuch thing as this great thing is, or hath been
heard like it. *Deut.* iv. 32.

* ASKANCE. } *adv.* Sideways; obliquely.
* ASKAUNCE. } —Zelmane, keeping a coun-
tenance *aſkance*, as ſhe underſtood him not, told
him, it became her evil. *Sidney*.—

* ASKAUNT. *adv.* Obliquely; on one ſide.—
At this Achilles roll'd his furious eyes,
Fix'd on the king *aſkaunt*; and thus replies,
O, impudent. *Dryden*.

ASKEATON, a town of Ireland, in Limerick
county, which ſent two members to parliament.
ASKELON. See ASCALON.

(1.) * ASKER. *n. ſ.* [from *aſk*.] 1. Petitioner.—
The greatneſs of the *aſker*, and the ſmallneſs of
the thing aſked, had been ſufficient to enforce his
requeſt. *South*. 3. Enquirer.—Every *aſker* being
ſatisfied, we may conclude, that all their concep-
tions of being in a place are the ſame. *Digby*.

(2.) * ASKER. *n. ſ.* A water newt.

ASKERON, a place 5 miles from Doncaſter,
noted for a medicinal ſpring It is a ſtrong ſul-
phureous water, and is ſlightly impregnated with
a purging ſalt. It is recommended internally and
externally in ſtrumous and other ulcers, ſcabs, le-
proſy and ſimilar complaints. It is good in chro-
nic obſtructions, and in caſes of worms and foul-
neſs of the bowels.

ASKERSUND, a ſea port of Sweden.

ASKERTON CASTLE, a ſmall town in Cum-
berland, near the Picts Wall.

(1.) ASKEW, Anne, an unfortunate Engliſh la-
dy, the daughter of Sir William Aſkew, of Kelſay,
in Lincolnſhire. She was born at her father's ſeat
about 1520; and received a liberal education. Ear-
ly in life ſhe was married to a Mr Kyme, contra-
ry to her own inclination; and being harſhly treat-
ed by her huſband, ſhe went to the court of Henry
VIII. to ſue for a ſeparation. Here ſhe was taken

particular

particular notice of by ſuch ladies as were attached to the reformation; but on this account ſhe was arreſted, and acknowledging her religious principles, was ſent priſoner to Newgate. After having been put to the rack with ſavage cruelty in the Tower, ſhe was burnt in Smithfield, along with her tutor, and two other perſons of the ſame faith, in 1546. Her letters in Fox and Stripe, ſhow her to have been an accompliſhed and pious woman.

(2.) ASKEW, Anthony, a learned Engliſh phyſician, born at Kendal, in Weſtmoreland, in 1722. He received the firſt part of his education at Sedburgh ſchool, and afterwards went to Emanuel college, Cambridge, where he took his degree of B. A. in 1745. From Cambridge, he went to Leyden; and after he had ſtudied there a year, he accompanied the Engliſh ambaſſador to Conſtantinople. When he had finiſhed his travels, he returned to Cambridge, and took his degree of M. D. and ſhortly after was admitted fellow of the Royal College of Phyſicians, and of the Royal Society. He collected a noble library, which, after his death, was ſold by auction, and brought upwards of 5000l. He died at Hampſtead in 1784.

(3.) * ASKEW. *adv.* [from *a* and *ſkew*.] Aſide; with contempt,—

Then take it, Sir, as it was writ,
Nor look *aſkew* at what it ſaith;
There's no petition in it.—— *Prior.*

ASKEYTON, a ſmall town of Ireland, 16 miles W. of Limerick.

ASKRIG, a town in the N. Riding of Yorkſhire, 6 miles S. by E. of York, and 243 N. of London. Lon. 1. 0. W. Lat. 52. 55. N.

ASLACKBY, or ASLEBY, a ſmall town in Lincolnſhire, 2 miles S. of Folkingham.

* *To* ASLAKE. *v. a.* [from *a* and *ſlake*, or *ſlack*.] To remit; to mitigate; to ſlacken. Obſolete.—

But this continual, cruel, civil war,
Nor ſkill can ſtint, nor reaſon can *aſlake*. *Spenſ.*

ASLAN, or ASLANI, } in commerce, a name given to the Dutch dollar, in moſt parts of the Levant. The word is alſo written corruptly, ASSELANI. It is originally Turkiſh, and ſignifies a lion, which is the figure ſtamped on it. The Arabs, taking the figure of a lion for a dog, called it *abuſketh*. It is ſilver but much alloyed, and is current for 115 or 120 aſpers. See ASPER.

* ASLANT. *adv.* [from *a* and *ſlant*.] Obliquely; on one ſide; not perpendicularly.—

There is a willow grows *aſlant* a brook,
That ſhews his hoar leaves in the glaſſy ſtream.
Shakeſpeare's Hamlet.

ASLEBY. See ASLACKBY.

* ASLEEP. *adv.* [from *a* and *ſleep*.] 1. Sleeping; at reſt.—

How many thouſands of my pooreſt ſubjects
Are at this hour *aſleep*! O gentle ſleep,
Nature's ſoft nurſe, how have I frighted thee!
Shakeſ.

2. To ſleep.—If a man watch too long, it is odds but he will fall *aſleep*. *Bacon's Eſſays.*—

Thus done the tales, to bed they creep,
By whiſpering winds ſoon lull'd *aſkeep*. *Milton.*

* ASLOPE. *adv.* [from *a* and *ſlope*.] With declivity; obliquely; not perpendicularly.—Set them not upright, but *aſlope*, a reaſonable depth under the ground. *Bacon.*

ASMATOGRAPHER, [from ασμα, a ſong, and γραφω, to write,] a compoſer of ſongs.

ASMER, a province of India, on this ſide the Ganges, between the Indus and Delhi.

ASMILD, or ASMIND, } a village of N. Jutland celebrated for an ancient convent in it.

ASMODAI, the name given by the Jews to the prince of demons; and, according to R. Elias the ſame with *Sammael*.

ASMONEUS, or ASSAMONEUS, the father of Simon, and chief of the Aſmoneans, a family that reigned over the Jews 126 years.

ASNA, or ESNA, a town in Upper Egypt, ſeated upon the Nile, believed by ſome authors to be the ancient Syena, though others ſay the ruins of it are ſtill to be ſeen near Aſſuan. It is ſo near the cataracts of the Nile, that they may be heard from thence. It contains ſeveral monuments of antiquity; and among the reſt an ancient Egyptian temple, pretty entire, all painted throughout, except in ſome places that are effaced by time. The columns are full of hieroglyphic figures. This ſuperb ſtructure is now made uſe of for a ſtable, wherein they put oxen, camels, and goats. A little way from thence are the ruins of an ancient nunnery, ſaid to be built by St Helena, ſurrounded with tombs.—Aſna is the principal town in theſe parts, and the inhabitants are rich in corn and cattle. They drive a conſiderable trade into Lower Egypt and Nubia, by means of the Nile, and alſo by the caravans that paſs over the Deſart. The inhabitants are all Arabs, except about 100 Copts, the ancient inhabitants, who are Chriſtians. They are under the government of the Turks, who have a cadi, and the Arabs have two ſheriffs of their own nation. Lon. 31. 40. E. Lat. 38. 15. or as others have it, 24. 45. N.

ASNAPPER, an Aſſyrian prince, mentioned in Ezra, iv. 10. who ſettled the original Samaritans in the country of the ten tribes. It is uncertain, whether he was Salmaneſer or Eſarhaddon, or one of their generals.

ASOLA, a town of Breſſa in Italy, belonging to the republic of Venice, 20 miles SE. of Breſſa, and 25 NW. of Mantua. Lon. 14. 18. E. Lat. 45. 15. N.

ASOLO, a town of Italy, in Treviſan, ſeated on a mountain 17 miles NW. of Treviſan, and 12 NE. of Baſſano. Lon. 12. 2. E. Lat. 45. 49. N.

* ASOMATOUS, *adj.* [from α priv. and σωμα, a body] Incorporeal, or without a body.

(1.) ASOPH, a diſtrict of the Ruſſian empire, bordering on the ſea of Aſoph (See N° 3.) It was wholly ceded to Catherine II, by the Grand Signior, in 1774; ſince which time ſeveral towns have been built in it, one of which is called CATHARINENSLAFF, i. e. *Catherine's Glory!* and is now the capital.

(2.) ASOPH, a town of Coban Tartary, in Aſia, ſeated on the river Don, near its mouth, a little to the E. of the Palus Mœotis, or Sea of Aſoph. It has often been taken and retaken. In 1739, and 1774, it was ceded to Ruſſia by the Turks. Lon. 44. 10. E. Lat. 47. 18. N.

(3.) ASOPH, or ZABAK, anciently called PALUS MŒOTIS, a ſea between Europe and Aſia, about 600 miles in circumference. It lies N.

the Black Sea, with which it communicates by the Strait of Caffa, the ancient Cimmerian Bofphorus.

(4.) ASOPH, the name of a village of the United States, which was burnt during the American war, and the whole defenceleſs inhabitants, men, women and children, barbarouſly maſſacred to the number of about 2000, in the night time! General Waſhington retaliated, the firſt fort he afterwards took, by giving no quarter till he had cut off an equal number of Britiſh troops!

——————*Quis talia fando*
Temperet a lachrymis?

ASOPIDES. See ASOPUS, N° 2.

ASOPO. See ASOPUL, N° 2.

(1.) ASOPUS, a town of Laconia, on the Sinus Laconius, with a port in a peninſula, between Boæ to the E. and the mouth of the Eurotas to the W. The citadel only remains ſtanding, now called by the ſailors, *Caſtel Rampano.*

(2.) ASOPUS, in ancient geography, the name of ſeveral rivers, viz. 1. in Bœotia, which running from mount Cithæron, and watering the territory of Thebes, ſeparates it from the territory of Platæa, and falls with an eaſt courſe into the Euripus, at Tanagra. On this river Adraſtus king of Sicyon built a temple to Nemeſis, and from it Thebes came to be ſurnamed ASOPIDES. It is now called ASOPO. 2. In Peloponneſus, which runs by Sicyon, and with a NW. courſe falls into the Sinus Corinthiacus, W. of Corinth. 3. In Phrygia Major, which with the Lycus waſhes Laodicea. 4. On the borders of Theſſaly, riſing in Mount Oeta, and falling into the Sinus Maliacus.

ASOR, or } in ancient geography, 1. a town in
ASORUS, } the SW. of Judah, near Aſcalon, called alſo Hazor, and Haſor-Hadata, tranſlated by the ſeventy Ασωρ Τοπος. 2. A town of Galilee; called the capital of all the kingdoms N. of Paleſtine. It was taken by Joſhua; the inhabitants were put to the ſword, and their houſes burnt. It was afterwards rebuilt, but remained ſtill in the hands of the Canaanites, though in the tribe of Naphtali. It lay N. of the Lacus Samachonites, called in Scripture the *Waters of Merom.*

ASOTIA, intemperance; prodigality.

ASOTUS, in ichthyology, a ſpecies of the ſilurus.

ASOW, a celebrated fortreſs of Ruſſia, once a place of conſiderable trade, but now demoliſhed. It was ſituated in the diſtrict of Bachmut, near the place where the Greeks many centuries ago built the city of Tanais, which was very famous for its trade, and underwent many viciſſitudes. The Genoſe, who ſettled a trade with Ruſſia ſoon after the diſcovery of Archangel by Captain Chancellor, became maſters of this place, and gave it the name of *Taan* or *Catana*: but the Tartars who were very powerful in theſe parts, ſeem to have been in poſſeſſion of it long before; for, as Buſching informs us, there are Aſcow coins ſtill extant, on which is the name of *Taktamyſi-an.* From the Genoeſe it fell into the hands of the Turks, loſt its trade, and became an inconſiderable town. In 1637, it was taken by the Coſacks, who defended it againſt the Turks in 1641, and next year ſet fire to it, and blew it up. The Turks rebuilt it with ſtrong fortifications. The Ruſſians laid claim to it in 1672, and took it in 1696; but, by the treaty of Pruth in 1711, it was reſtored to the Turks. In 1736, the Ruſſians became maſter of Aſow; but by the treaty of Belgrade they were obliged to relinquiſh and entirely deſtroyed it.

(1.) * ASP. ASPICK. *n. ſ.* [*aſpis*, Lat.] A kind of ſerpent, whoſe poiſon kills without a poſſibility of applying any remedy.—It is ſaid to be very ſmall, and peculiar to Egypt and Lybia. Thoſe that are bitten by it, die within three hours; and the manner of their dying being by ſleep without any pain, Cleopatra choſe it. *Calmet.*—

High-minded Cleopatra, that with ſtroke
Of *aſp's* ſting, herſelf did kill. *Fairy Queen.*

Scorpion, and *aſp*, and amphiſbæna dire,
And dipſas. *Milton.*

(2.) ASP is ſaid to be thus denominated from the Greek ασπις, *ſhield*, on account of its lying convolved in a circle, in the centre of which is the head, which it exerts, or raiſes, like the umbo or umbileus of a buckler. This ſpecies of ſerpent is very frequently mentioned by authors; but ſo careleſsly deſcribed, that it is not eaſy to determine which, if any of the ſpecies known at preſent, may probably be called by this name. It is ſaid to be common in Africa, and about the banks of the Nile; and Bellonius mentions a ſmall ſerpent which he had met with in Italy, and which had a ſort of callous excreſcence on the forehead, which he takes to have been the aſpis of the ancients. It is with the aſp that Cleopatra is ſaid to have diſpatched herſelf, and prevented the deſigns of Auguſtus, who intended to have carried her captive to adorn his triumphal entry into Rome. But the fact is conteſted: Brown places it among the vulgar errors. The indications of that queen's having uſed the miniſtry of the aſp, were only two almoſt inſenſible pricks found in her arm; and Plutarch ſays it is unknown what ſhe died of. At the ſame time, it muſt be obſerved, that the ſlightneſs of the pricks found in her arm furniſhes no preſumption againſt the fact; for no more than the prick of a needle-point dipt in the poiſon was neceſſary for the purpoſe. See the article SERPENT. Lord Bacon ſays, the aſp is the leaſt painful of all the inſtruments of death. He ſuppoſes it to have an affinity to opium, but to be leſs diſagreeable in its operation; and his opinion ſeems to correſpond with the accounts of moſt writers, as well as with the effects deſcribed to have been produced upon Cleopatra. The ancients had a plaſter called ὁι Ασπιδων, made of this terrible animal, of great efficacy as a diſcutient of ſtrumæ and other indurations, and uſed likewiſe againſt pains of the gout. The fleſh and ſkin, or exuviæ, of the creature, had alſo their ſhare in the ancient materia medica.

(3.) * ASP. *n. ſ.* A tree. See ASPEN.

ASPA, a town of Parthia, now called ISPAHAN. In Ptolemy the latitude ſeems to agree, being 33°; but whether the longitude does, is a queſtion. Lon. 51. 0. E. Lat. 32. 30.

(1.) * ASPALATHUS. *n. ſ.* [Latin.] 1. A plant called the roſe of Jeruſalem, or our lady's roſe. 2. The wood of a prickly tree, heavy, oleaginous, ſomewhat ſharp and bitter to the taſte.—

Aſpalathus

Aſpalathus affords an oil of admirable ſcent, reputed one of the beſt perfumes. *Chambers.*

(2.) ASPALATHUS, AFRICAN BROOM: A genus of the decandria order, belonging to the diadelphia claſs of plants: and in the natural method ranking under the 32d order, Papilionaceæ. The calyx conſiſts of 5 diviſions: the pod is oval, and contains 2 ſeeds. Of this genus there are 19 ſpecies; all of which are natives of warm climates, and muſt be preſerved in ſtoves by thoſe who would cultivate them here. The roſe wood, whence the oleum Rhodii is obtained, is one of the ſpecies, but of which we have yet had no particular deſcription.

(3.) ASPALATHUS, in pharmacy, is alſo called *lignum Rhodium*, or roſe wood; and by ſome, Cypreſs wood: the former on account of its ſweet ſmell, or growth in the iſland of Rhodes; the latter from its being alſo found in the iſland of Cyprus. It was anciently in much repute, as an aſtringent and ſtrengthener but is now little uſed internally. In virtue, taſte, ſmell, and weight, it reſembles the *lignum aloes*; and in phyſic they are frequently ſubſtituted for each other. Aſpalathus is chiefly uſed in ſcenting pomatums, and liniments. See § 1, and 2.

ASPALE, a village near Debenham, Suffolk.

(1.) * ASPARAGUS. *n. ſ.* [Lat.] The name of a plant. It has a roſaceous flower of ſix leaves, placed orbicularly, out of whoſe centre riſes the pointal, which turns to a ſoft globular berry, full of hard ſeeds. *Miller.*—*Aſparagus* affects the urine with a fetid ſmell, eſpecially if cut when they are white; and therefore have been ſuſpected by ſome phyſicians, as not friendly to the kidneys; when they are older, and begin to ramify, they loſe this quality; but then they are not ſo agreeable. *Arb.*

(2.) ASPARAGUS, SPARAGUS, SPERAGE, or SPARROWGRASS: A genus of the monogynia order, belonging to the hexandria claſs of plants; and in the natural method, ranking under the 11th order, Sarmentaceæ. The calyx is quinquepartite, and erect; the 3 inferior petals are bent outwards; the berry has 3 cells, and contains two ſeeds. There are 10 ſpecies; but the only one cultivated in the gardens is the common aſparagus, with an upright herbaceous ſtalk, briſtly leaves, and equal ſtipula. The other ſpecies are kept only in the gardens of the curious, for the ſake of variety.

(3.) ASPARAGUS, CULTURE OF THE. The garden aſparagus is with great care cultivated for the uſe of the table. The propagation of this uſeful plant is from ſeed; and as much of the ſucceſs depends upon the goodneſs of the ſeed, it is much better to ſave it than to buy it at the ſhops. The manner of ſaving it is this: Mark with a ſtick ſome of the faireſt buds; and when they are run to berry, and the ſtalks begin to dry and wither, cut them up; rub off the berries into a tub, and pouring water upon them, rub them about with your hands; the huſks will break and let out the ſeed, and will ſwim away with the water, in pouring it off; ſo that in repeating this two or three times, the ſeeds will be clean waſhed, and found at the bottom of the tub. Theſe muſt be ſpread on a mat to dry, and in the beginning of February, muſt be ſown on a bed of rich earth. They muſt not be ſown too thick, and muſt be trod into the ground, and the earth raked over them ſmooth: the bed is to be kept clear of weeds all the ſummer; and in October, when the ſtalks are withered and dry, a little rotten dung muſt be ſpread half an inch thick over the whole ſurface of the bed. Next ſpring, the plants will be fit to plant out; the ground muſt therefore be prepared for them by trenching it well, and burying a large quantity of rotten dung in the trenches, ſo that it may lie at leaſt 6 inches below the ſurface of the ground: when this is done, level the whole plot exactly, taking out all the looſe ſtones. This is to be done juſt at the time when the aſparagus is to be planted out; which muſt be in the beginning of March, if the ſoil is dry, and the ſeaſon forward; but in a wet ſoil, it is better to wait till the beginning of April, which is about the ſeaſon that the plants are beginning to ſhoot. The ſeaſon being now come, the roots muſt be carefully taken up with a narrow-pronged dung-fork, ſhaking them out of the earth, ſeparating them from each other, and obſerving to lay all their heads even, for the more convenient planting them; which muſt be done in this manner. Lines muſt be drawn, at a foot diſtance each, ſtraight acroſs the bed; theſe muſt be dug into ſmall trenches of ſix inches deep, into which the roots muſt be laid, placing them againſt the ſides of the trench, with their buds in a right poſition upwards, and ſo that, when the earth is raked over them, they may be two inches under the ſurface of the ground. Between every 4 rows, a ſpace of two feet and a half ſhould be left for walking in, to cut the aſparagus. When the aſparagus is thus planted, a crop of onions may be ſown on the ground, which will not at all hurt it. A month after this, the aſparagus will come up, when the crop of onions muſt be thinned, and the weeds carefully cleared away. About Auguſt the onions will be fit to pull up. In October following, cut off the ſhoots of the aſparagus, within two inches of the ground, clear well all weeds away, and throw up the earth upon the beds, ſo as to leave them five inches above the level of the alleys. A row of colworts may be planted in the middle of the alleys, but nothing muſt now be ſown on the beds. In the ſpring, the weeds muſt be hoed up, and all the ſummer the beds kept clear of weeds. In October, they muſt be turned up, and earthed again, as the preceding ſeaſon. The ſecond ſpring after planting, ſome of the young aſparagus may be cut for the table. The larger ſhoots ſhould only be taken, and theſe ſhould be cut at two inches under ground, and the beds every year managed as in the ſecond year. But as ſome people are very fond of early aſparagus, the following directions are given, by which it may be obtained any time in winter: Plant ſome good roots at one year old in a moiſt rich ſoil, about eight inches apart; the ſecond and third year after planting, they will be ready to take up for the hot-beds. theſe ſhould be made pretty ſtrong, about three feet thick, with new ſtable dung that has fermented a week or more; the beds muſt be covered with earth ſix inches thick; then againſt a ridge made at one end, begin to lay in your plants without

without trimming or cutting the fibres, and between every row lay a little ridge of fine earth, and proceed thus till the bed is planted; then cover the bed two inches thick with earth, and encompaſs it with a ſtraw band, and in a week, or as the bed is in the temper, put on the frames and glaſſes, and lay on three inches thick of freſh earth over the beds, and give them air and add freſh heat to them as it requires. Theſe beds may be made from November till March, which will laſt till the natural graſs comes on.

(4.) ASPARAGUS, MEDICINAL USES OF. The roots have a bitteriſh mucilaginous taſte, inclining to ſweetneſs; the fruit has much the ſame kind of taſte; the young ſhoots are more agreeable than either. Aſparagus promotes appetite, but affords little nouriſhment. It gives a ſtrong ill ſmell to the urine in a little time after eating it, and for this reaſon chiefly is ſuppoſed to be diuretic: it is likewiſe eſteemed aperient and deobſtruent; the root is one of the five called *opening roots*. Some ſuppoſe the ſhoots to be moſt efficacious; others, the root; and others, the bark of the root. Stahl is of opinion, that none of them have any great ſhare of the virtues uſually aſcribed to them. Aſparagus appears from experience to contribute very little either to the exciting of urine when ſuppreſſed, or increaſing its diſcharge; and in caſes where aperient medicines generally do ſervice, this has little or no effect.

(1.) ASPASIA, among ancient phyſicians, a conſtrictive medicine for the pudenda muliebra. It conſiſted of wool, moiſtened with an infuſion of unripe galls.

(2.) ASPASIA of Miletus, a courtezan who ſettled at Athens under the adminiſtration of Pericles, and one of the moſt noted ladies of antiquity. She was of admirable beauty: yet her wit and eloquence, ſtill more than her beauty, gained her extraordinary reputation among all ranks in the republic. In eloquence ſhe ſurpaſſed all her contemporaries; and her converſation was ſo entertaining and inſtructive, that notwithſtanding the diſhonourable commerce ſhe carried on, perſons of the firſt diſtinction, male and female, reſorted to her houſe as to an academy: ſhe even numbered Socrates among her hearers and admirers. She captivated Pericles in ſuch a manner, that he diſmiſſed his own wife, to eſpouſe her; and, by her univerſal knowledge, irreſiſtible elocution, and intriguing genius, ſhe in a great meaſure influenced the adminiſtration of Athens. She was accuſed of having excited, from motives of perſonal reſentment, the war of Peloponneſus; yet, calamitous as that long and obſtinate conflict proved to Greece, and particularly to Athens, Aſpaſia occationed ſtill more incurable evils to both. Her example and inſtructions, formed a ſchool at Athens, by which her dangerous profeſſion was reduced into a ſyſtem. The companions of Aſpaſia ſerved as models for painting and ſtatuary, and themes for poetry and panegyric. Nor were they merely the objects but the authors of many literary works, in which they eſtabliſhed rules for the behaviour of their lovers, particularly at table; and explained the art of gaining the heart and captivating the affections. The dreſs, behaviour, and artifices of this claſs of women, became continually more ſeductive and dangerous; and Athens thenceforth remained the chief ſchool of vice and pleaſure, as well as of literature and philoſophy.

ASPASTICUM, } i. e. a greeting houſe, [from
ASPATICUM, } ἀσπάζομαι, I ſalute,] in eccleſiaſtical writers, an apartment, adjoining to the ancient churches, wherein the biſhop and preſbyters ſat, to receive the ſalutations of thoſe who came to viſit them, deſire their bleſſing, or conſult them.

ASPATRIA, or SPYATRY, a village in Cumberland, between Maryport and Wigton.

(1.) * ASPECT. *n. ſ.* [*aſpectus*, Lat. It appears anciently to have been pronounced with the accent on the laſt ſyllable, which is now placed on the firſt.] 1. Look; air; appearance.—They are in my judgment, the image or picture of a great ruin, and have the true *aſpect* of a world lying in rubbiſh. *Burnet's Theory.* 2. Countenance; look;

Yet had his *aſpect* nothing of ſevere,
But ſuch a face as promis'd him ſincere. *Dryd.*

3. Glance; view; act of beholding.—

Fairer than faireſt, in his faining eye,
Whoſe ſole *aſpect* he coun's felicity. *Spenſer.*

4. Direction towards any point; view; poſition.—I have built a ſtrong wall, faced to the ſouth *aſpect* with brick. *Swift.* 5. Diſpoſition of any thing to ſomething elſe; relation.—The light got from the oppoſite arguings of men of parts, ſhewing the different ſides of things, and their various *aſpects* and probabilities, would be quite loſt, if every one were obliged to ſay after the ſpeaker. *Locke.* 6. Diſpoſition of a planet to other planets.—Why does not every ſingle ſtar ſhade a ſeparate influence, and have *aſpects* with other ſtars of their own conſtellation? *Bentley's Sermons.*

(2.) ASPECT, in aſtronomy, denotes the ſituation of the planets and ſtars with reſpect to each other. There are 5 different aſpects. 1. Sextile aſpect is when the planets or ſtars are 60° diſtant, and marked thus *. 2. The quartile, or quadrate, when they are 90° diſtant, marked □. 3. Trine, when 120 diſtant, marked △. 4. Oppoſition, when 180° diſtant, marked ☍. And, 5. Conjunction, both in the ſame degree, marked ☌. Kepler, who added 8 new ones, defines aſpect to be the angle formed by the rays of two ſtars meeting on the earth, whereby their good or bad influence is meaſured: for it is to be obſerved, that theſe aſpects being firſt introduced by aſtrologers, were diſtinguiſhed into benign, malignant, and indifferent; the quartile and oppoſition being accounted malign: the trine and ſextile, benign or friendly; and the conjunction indifferent.

(3.) ASPECT, in gardening, ſignifies expoſure.

(4.) ASPECT, DOUBLE, is uſed in painting, where a ſingle figure is ſo contrived, as to repreſent two or more different objects, either by changing the eye, or by means of angular glaſſes. See ANAMORPHOSIS, CATOPRICS, &c.

* *To* ASPECT. *v. a.* [*aſpicio*, Lat.] To behold: not uſed.—

Happy in their miſtake, thoſe people whom
The northern pole *aſpects*; whom fear of death
(The greateſt of all human fears) ne'er moves.
Temple.

* ASPECTABLE. *adj.* [*aſpectabilis*, Lat.] Viſible;

fible: being the ſubject of ſight.—He was the ſole cauſe of this *aſpectable* and perceivable univerſal. *Raleigh.*

* ASPECTION. *n. ſ.* [from *aſpect.*] Beholding; view.—A Mooriſh queen, upon *aſpection* of the picture of Andromeda, conceived and brought forth a fair one. *Brown.*

(1.) * ASPEN. *adj.* [from *aſp* or *aſpen.*] 1. Belonging to the aſp tree.—

Oh! had the monſter ſeen thoſe lily hands
Tremble like *aſpen* leaves upon a lute. *Shakeſp.*

2. Made of aſpen wood.

(2.) * ASPEN, or ASP. *n. ſ.* [*eſpe*, Dutch; *aſp.* Dan. *eſpe*, trembling, Sax. *Somner.*] See POPLAR, of which it is a ſpecies. The leaves of this tree always tremble.—The *aſpen* or *aſp* tree hath leaves much the ſame with the poplar, only much ſmaller, and not ſo white. *Mortimer.*

(3.) ASPEN TREE, in botany. See POPULUS.

(1.) * ASPER. *adj.* [Lat.] Rough; rugged. This word I have found only in the following paſſage.—All baſe notes, or very treble notes, give an *aſper* ſound; for that the baſe ſtriketh more air than it can well ſtrike equally. *Bacon.*

(2.) ASPER, in commerce, or ASPRE, a little Turkiſh ſilver coin, wherein moſt of the Grand Signior's revenues are paid. The *aſper* is worth ſomething more than an Engliſh halfpenny. The only impreſſion it bears, is that of the prince's name under whom it was ſtruck. The pay of the Janizaries is from 2 to 12 *aſpers per diem.*

(3.) ASPER, in grammar, an accent peculiar to the Greek language, marked thus (‘); and importing, that the letter over which it is placed ought to be ſtrongly aſpirated, or pronounced as if an *h* were prefixed.

(4.) ASPER, in ichthyology, a ſmall fiſh caught in the Rhone, ſo called from the roughneſs of its ſcales. Its head is large, in proportion to its body, and of a pointed ſhape. It has no teeth, but its jaws are ſharp to the touch. It is of a dark red colour, with large black ſpots. It is good to eat, and is eſteemed aperitive.

ASPERA ARTERIA, in anatomy, the windpipe or trachea. See ANATOMY, § 354—358.

* *To* ASPERATE. *v. a.* [*aſpero*, Lat.] To roughen; to make rough or uneven.—Thoſe corpuſcles of colour, inſinuating themſelves into all the pores of the body to be dyed, may *aſperate* its ſuperficies, according to the bigneſs and texture of the corpuſcles. *Boyle.*

* ASPERATION. *n. ſ.* [from *aſperate.*] A making rough. *Dict.*

ASPERGELLOUS, in botany, the name given by Micheli to that genus of moſſes, called by Dillenius and others, byſſus.

ASPERGILE, or } in antiquity, a long bruſh
ASPERGILIUM, } made of horſe hair fixed to a handle, wherewith the luſtral water was ſprinkled on the people in luſtrations and purifications. The ancients, inſtead of a bruſh, made uſe of branches of laurel and olive. It is alſo applied to the inſtrument in Romiſh churches, wherewith holy water is ſprinkled.

ASPERJULA. See ASPERULA.

ASPERIFOLIÆ PLANTÆ, rough leaved plants. The name of a claſs in Hermannus, Boerhaave, and Ray's methods, conſiſting of plants which have naked ſeeds, and whoſe leaves are rough to the touch. In Tournefort's ſyſtem, theſe plants conſtitute the third ſection or order of the 2d claſs; and in Linnæus's ſexual method, they make a part of the pentandria monogynia.

ASPERIFOLIATE, or ASPERIFOLIOUS, among botaniſts, ſuch plants as are rough leaved, having their leaves placed alternately on their ſtalks, and a monopetalous flower divided into five parts. They conſtitute the 49th order of plants in the *Fragmenta Methodi Naturalis* of Linnæus, in which are theſe genera, tournefortia, cerinthe, ſymphytum, pulmonaria, anchuſa, lithoſpermum, myoſotis, heliotropium, cynogloſſum, aſperugo, lycopſis, echium, borrago: *magis minuſve oleraceæ, mucilagineſæ, & glutineſæ ſunt.*

* ASPERIFOLIOUS. *adj.* [from *aſper*, rough, and *folium*, a leaf, Lat.] One of the diviſions of plants, ſo called from the roughneſs of their leaves.

(1.) * ASPERITY. *n. ſ.* [*aſperitas*, Lat.] 1. Unevenneſs; roughneſs of ſurface.—Sometimes the pores and *aſperities* of dry bodies are ſo incommenſurate to the particles of the liquor, that they glide over the ſurface. *Boyle.* 2. Roughneſs of ſound; harſhneſs of pronunciation. 3. Roughneſs or ruggedneſs of temper; moroſeneſs; ſourneſs; crabbedneſs.—The charity of one, like kindly exhalations, will deſcend in ſhowers of bleſſings; but the rigour and *aſperity* of the other, in a ſevere doom upon ourſelves. *Governm. Tongue.*

(2.) ASPERITY, the inequality of the ſurface of any body, which hinders the hand from paſſing over it freely. From the teſtimony of ſome blind perſons, it has been ſuppoſed that every colour hath its particular degree of aſperity; though this has been denied by others. See the article BLIND.

ASPERJULA. The ſame with ASPERULA.

* ASPERNATION. *n. ſ.* [*aſpernatio*, Lat.] Neglect; diſregard. *Dict.*

ASPEROSA, a town of Turky, in Europe; it is a biſhop's ſee, ſituated on the coaſt of the Archipelago. Lon. 25. 20. E. Lat. 40. 58. N.

* ASPEROUS. *adj.* [*aſper*, Lat.] Rough; uneven.—Black and white are the moſt *aſperous* and unequal of colours; ſo like, that it is hard to diſtinguiſh them: black is the moſt rough. *Boyle.*

* *To* ASPERSE. *v. a.* [*aſpergo*, Lat.] To beſpatter with cenſure or calumny.—In the buſineſs of Ireland, beſides the opportunity to *aſperſe* the king, they were ſafe enough. *Clarendon.*

* ASPERSION. *n. ſ.* [*aſperſio*, Lat.] 1. A ſprinkling.—It exhibits a mixture of new conceits and old, whereas the inſtauration gives the new unmixed, otherwiſe than with ſome little *aſperſion* of the old, for taſte's ſake. *Bacon.* 2. Calumny; cenſure.—The ſame *aſperſions* of the king, and the ſame grounds of a rebellion. *Dryden.*

ASPERUGO, SMALL WILD BUGLOSS, in botany, a genus of the pentandria monogynia claſs; and in the natural method ranking under the *Aſperifoliæ.* The calyx of the fruit is compreſſed, with folds flatly parallel, and ſinuous. There are two ſpecies, viz.

1. ASPERUGO ÆGYPTIACA, a native of Egypt.

2. ASPERUGO PROCUMBENS, or wild bugloss, a native of Britain; which is eaten by horſes, goats, ſheep, and ſwine; but cows are not fond of it.

ASPERULA, WOODROOF: A genus of the tetra-

nia order, belonging to the hexandria claſs of s; and in the natural method ranking under 17th order, *Stellatæ*. The corolla is infundiform; and the capſule contains two globular . There are two ſpecies; which both grow in Britain, and therefore are ſeldom admitted gardens: viz.

ASPERULA CYNANCHICA, found on chalky The roots are uſed for dyeing red in Sweden.

ASPERULA ODORATA, a low umbelliferous , growing wild in woods and copſes, and ring in May. It has an exceeding pleaſant , which is improved by moderate exiccation; afte is ſubſaline, and ſomewhat auſtere. It rts its flavour to vinous liquors. Aſperula is ɔſed to attenuate viſcid humours, and ſtrengthe tone of the bowels; it is recommended in uctions of the liver and biliary ducts, and by in epilepſies and palſies; modern practice everthelefs rejected it. The ſmell of it is ſaid ive away ticks and other inſects.

PEYTIA, a town of Spain, in Biſcay, ſeated e Viola, in a fine valley, near the diſtricts of la and Onis. Lon. 2. 22. W. Lat. 43. 20. N.

PHALATUS, in botany. See ROBINA.

PHALITES, in anatomy, the fifth vertebra loins.

ASPHALTICK. *adj.* [from *aſphaltos*.] Gumbituminous.—

And with *aſphaltick* ſlime, broad as the gate, ep to the roots of hell, the gather'd beach ey faſten'd. *Milton.*

) ASPHALTITES, a lake of Judea, ſo calldm the great quantity of bitumen it pro; called alſo the *Dead Sea*; and from its ſitu, the *Eaſt Sea*; the *Salt Sea*, the *Sea of So*the *Sea of the Deſart*, and the *Sea of the Plain*, e ſacred writings. It is incloſed on the E. *N.* with exceeding high mountains, many of craggy and dreadful to behold. On the N. the plain of Jericho; or, if we take in both of the Jordan, it has the Great Plain, proſo called, on the S. which is open, and exbeyond the reach of the eye. Joſephus s this lake 580 furlongs in length, from the h of the Jordan to the town of Segor, on the lite end, that is about 22 leagues; and about urlongs, or 5 leagues, in its largeſt breadth; our modern accounts commonly give it 20 es in length, and 6 or 7 in breadth. On the de of it is a kind of promontory, where they nd to ſhow the Remains of Lot's metamord wife. Joſephus ſays it was ſtill ſtanding time; but when Prince Radziville inquired it, they told him there was no ſuch ſalt pilſtatue to be found in all that part. Howthey have found means, about a century afm, to recover, as they pretended to aſſure laundrell, a block or ſtump of it, which may ne grow up, with a little art, into its ancient

) ASPHALTITES, ANCIENT ACCOUNTS OF. hat has been ſaid and written of this memolake, fable is much blended with truth. We old that it aroſe from the ſubmerſion of the of Siddim, where once ſtood, as is commonported, the three cities which periſhed in the ulous conflagration, with Sodom and Gomorrah, for their unnatural and deteſtable wickedneſs: on which account this lake has been looked upon as a laſting monument of the juſt judgment of God, to deter mankind from ſuch abominations. Hence it is added, that the waters of the lake are ſo impregnated with ſalt, ſulphur, and other bituminous ſtuff, that nothing will ſink or live in it; and that it caſts ſuch ſtench and ſmoke, that the very birds die in attempting to fly over it. The deſcription likewiſe of the apples that grew about it, fair without, and only aſhes and bitterneſs within, were looked upon as a farther monument of God's anger. Many travellers have alſo deſcribed not only the lake, but all the country round about, as appearing dreadful to behold, all ſulphureous, bituminous, ſtinking, and ſuffocating: and laſtly, it hath been affirmed that the ruins of the five cities are ſtill to be ſeen in clear weather, and have been actually ſeen in theſe latter times.

(3.) ASPHALTITES, ANCIENT ACCOUNTS OF, DOUBTED. All theſe ſurpriſing things, however, though commonly, and long, received among Chriſtians, have been of late much exploded, not only by the teſtimony of very credible witneſſes, but even by arguments drawn from ſcripture, that we muſt give them up as inventions, unleſs we will ſuppoſe the face and nature of all theſe things to have been entirely changed. Thoſe, in particular, of bodies not ſinking in the water, and of birds being filled with the exhalation of it, appear now falſe in fact. It is true, the quantity of ſalt, alum and ſulphur, with which it is impregnated, render it ſo much ſpecifically heavier (Dr Pococke ſays one fifth) than freſh water, that bodies will not ſo eaſily ſink: yet that author, and others, aſſure us, they have ſwam and dived in it; and, as to the birds, we are told likewiſe, that they will fly over it without any harm. To reconcile theſe things with the experiments, which, Pliny tells us, had been made by Veſpaſian, is impoſſible, without ſuppoſing that thoſe ingredients have been ſince much exhauſted, which, indeed, is not at all improbable; ſuch quantities of them, that is, of the bitumen and ſalt, having been all along, and being ſtill taken off, and ſuch ſtreams of freſh water continually pouring into it, as may reaſonably be ſuppoſed to have conſiderably diminiſhed its gravity and denſeneſs. For, with reſpect to its ſalt, we are told, the Arabs made quantities of it from that lake, in large pits about the ſhore, which they fill with that water, and leave to be cryſtallized by the ſun. This ſalt is in ſome caſes much commended by Galen, as very wholeſome, and a ſtrengthener of the ſtomach, &c. by its unpleaſant bitterneſs. What likewiſe relates to the conſtant ſmoke aſcending from the lake, its changing the colour of its water three times a-day, ſo confidently affirmed by Joſephus, and other ancients, and confirmed by Prince Radziville and other moderns, who pretend to have been eye-witneſſes of it, is all now in the ſame manner exploded by others of more modern date, and of at leaſt equal candour.

(4.) ASPHALTITES, MODERN ACCOUNTS OF. The unhealthineſs of the air about this lake was affirmed by Joſephus and Pliny, eſpecially on the weſt. The monks that live in the neighbourhood confirm this, and would have diſſuaded Dr Po-

cocke from going to it on that account; and, as he ventured to go and bathe in it, and was, two days after, ſeized with a dizzineſs, and violent pain in the ſtomach which laſted near 3 weeks, they made no doubt but it was occaſioned by it; and he doth not ſeem to contradict them. As to the water, it is, though clear, ſo impregnated with ſalt, that thoſe who dive into it come out covered with a kind of ſaline matter. There is one remarkable thing relating to this lake, generally agreed on by all travellers and geographers; viz. that it receives the waters of Jordan, a conſiderable river, the brooks of Jabbok, Kiſhon, Arnon, and other ſprings, which flow into it from the adjacent mountains, and yet never overflows, though there is no viſible way to be found by which it diſcharges that great influx. Some naturaliſts have been greatly embaraſſed to find a diſcharge for theſe waters; and have therefore been inclined to ſuſpect the lake had a communication with the Mediterranean. But, beſides that we know of no gulph to corroborate this ſuppoſition, it has been demonſtrated by accurate calculations, that evaporation is more than ſufficient to carry off the waters brought by the rivers. It is, in fact, very conſiderable; and frequently becomes ſenſible to the eye, by the fogs with which the lake is covered at the riſing of the ſun, and which are afterwards diſperſed by the heat. It is to be obſerved here, that the name of *Dead Sea* is not to be found in the ſacred writings; but has been given to this lake becauſe no creature will live in it, on account of its exceſſive ſaltneſs, or rather bituminous quality; for the Hebrews rank ſulphur, nitre, and bitumen, under the general name of *ſalt*. However, ſome late travellers have found cauſe to ſuſpect the common report of its breeding no living creature; one of them having obſerved, on the ſhore, two or three ſhells of fiſh like thoſe of the oyſter, and which he ſuppoſes to have been thrown up by the waves, at two hours diſtance from the mouth of the Jordan, which he there takes notice of, leſt they ſhould be ſuſpected to have been brought into the lake by that way. And Dr Pococke, though he neither ſaw fiſh nor ſhells, tells us, on the authority of a monk, that ſome ſort of fiſh had been caught in it; and gives us his opinion, that as ſo many ſorts live in ſalt-water, ſome kind may be ſo formed as to live in a bituminous one. Mr Volney, however, affirms, that it contains neither animal nor vegetable life. We ſee no verdure on its banks, nor are fiſh to be found within its waters. But he adds, that it is not true that its exhalations are peſtiferous to deſtroy birds flying over it. "It is very common (ſays he) to ſee ſwallows ſkimming its ſurface, and dipping for the wares neceſſary to build their neſts. The real cauſe which deprives it of vegetables and animals is the extreme ſaltneſs of the water, which is infinitely ſtronger than that of the ſea. The ſoil around it, equally impregnated with this ſalt, produces no plants; and the air itſelf, which becomes loaded with it from evaporation, and which receives alſo the ſulphureous and bituminous vapours, cannot be favourable to vegetation: hence the deadly aſpect which reigns around this lake. In other reſpects, the ground about it, however, is not marſhy; and its waters are limpid and incorruptible, as muſt be the caſe with a diſſolution of ſalt. The origin of this mineral is eaſy to be diſcovered; for on the ſouth-weſt ſhore are mines of foſſil ſalt, of which I have brought away ſeveral ſpecimens. They are ſituated on the ſide of the mountains which extend along that border; and, for time immemorial, have ſupplied the neighbouring Arabs, and even the city of Jeruſalem. We find alſo on this ſhore fragments of ſulphur and bitumen, which the Arabs convert into a trifling article of commerce; as alſo hot fountains, and deep crevices, which are diſcovered at a diſtance by little pyramids built on the brink of them. We likewiſe find a ſort of ſtone, which, on rubbing, emits a noxious ſmell, burns like bitumen, receives a poliſh like white labaſter, and is uſed for the paving of court yards. At intervals, we alſo meet with unſhapen blocks, which prejudiced eyes miſtake for mutilated ſtatues, and which paſs with ignorant and ſuperſtitious pilgrims for monuments of the adventure of Lot's wife; though it is no where ſaid ſhe was metamorphoſed into ſtone like Niobe, but into ſalt, which muſt have melted the enſuing winter."—It is on account of this bitumen that it hath had the name of *Aſphaltites*, it being reported to have thrown up great quantities of the aſphaltum, a drug much in uſe among the Egyptians, and other nations, for embalming of dead bodies. Joſephus aſſures us, that in his days it roſe in lumps as big as an ox without its head, and ſome even larger. But, whatever it may have formerly done, we are aſſured by Mr Maundrell, and others, that it is now to be found but in ſmall quantities along the ſhore, though in much greater near the mountains on both ſides the lake. The contrary, however, is ſince affirmed by later travellers. Dr Pococke tells us, that is obſerved to float on the ſurface of the water, and come on the ſhore, after windy weather, where the Arabians gather it, and put it to all the uſes that common pitch is uſed for, even in the compoſitions of ſome medicines; and Mr Shaw tells us, he was there informed, that it was raiſed at certain times from the bottom in large hemiſpheres, which, as ſoon as they touch the ſurface, and are acted upon by the external air, burſt at once, with great noiſe and ſmoke, like the *pulvis fulminans* of the chemiſts, and diſperſing in a thouſand pieces. From theſe judicious authors we may conclude the reaſon of Mr Maundrell's miſtake, both as to the lake's throwing it up only on certain ſeaſons, (that gentleman might be there at the wrong time); and likewiſe as to his not obſerving it about the ſhores, ſeeing the Arabs are there ready to gather it as ſoon as thrown up. All of them deſcribe it as reſembling our black pitch, ſo as not to be diſtinguiſhed from it but by its ſulphureous ſmoke and ſtench when ſet on fire; and it hath been commonly thought to be the ſame with that which our druggiſts call under the name of *bitumen Judaicum*, or Jewiſh pitch, though we have reaſon to think that the laſt is factitious, and that there is now none of the right aſphaltum brought from Judea. It has alſo been confounded with a ſort of blackiſh combuſtible ſtone thrown on the ſhore, and called by ſome *Moſes's ſtone*, which, being held in the flame of a candle, ſoon burns, and caſts a ſmoke and intoler-

intolerable ſtench; but has this extraordinary property, that though it loſes much of its weight and colour, becoming in a manner white, yet it diminiſhes nothing of its bulk. Theſe, Dr Pococke tells us, are found about 2 or 3 leagues from the ſhore. He concludes, however, from it, that a *ſtratum* of that ſtone under the lake is probably one part of the matter that feeds the ſubterraneous fire, and cauſes the bitumen to boil up out of it.

* ASPHALTOS. *n. ſ.* [ασφαλτος, bitumen.] A ſolid, brittle, black, bituminous, inflammable ſubſtance, reſembling pitch, and chiefly found ſwimming on the ſurface of the *Lacus Aſphaltites*, or Dead ſea, where anciently ſtood the cities of Sodom and Gomorrah. It is caſt up in the nature of liquid pitch, from the bottom of this ſea; and being thrown upon the water, ſwims like other fat bodies, and condenſes gradually.

(1.) * ASPHALTUM. *n. ſ.* [Lat.] A butiminous ſtone found near the ancient Babylon, and lately in the province of Neufchatel; which, mixed with other matters, makes an excellent cement, incorruptible by air, and impenetrable by water; ſuppoſed to be the mortar ſo much celebrated among the ancients, with which the walls of Babylon were laid. *Chambers.*

(2.) ASPHALTUM, BITUMEN JUDAICUM, or JEWS PITCH, is a light ſolid bitumen, of a duſky colour on the outſide, and a deep ſhining black within; of very little taſte: and having ſcarcely any ſmell, unleſs heated, when it emits a ſtrong pitchy one. It is found in a ſoft or liquid ſtate on the ſurface of the Dead Sea, and by age grows dry and hard. The ſame kind of bitumen is met with likewiſe in the earth, in China, America, and in ſome places of Europe, as the Carpathian hills, France, &c. There are ſeveral kinds of Jews pitch in the ſhops: but none of them are genuine. They have little other title indeed to the name than their being artificially compounded by *Jews*; and as they are a medley of various ingredients; their medicinal uſe begins to be deſervedly laid aſide, notwithſtanding the diſcutient, reſolvent, pectoral, and other virtues, attributed to this bitumen by the ancients. The true aſphaltum was formerly uſed in embalming the bodies of the dead. The thick and ſolid aſphalta are at preſent employed in Egypt, Arabia, and Perſia, as pitch for ſhips; as the fluid ones, for burning in lamps, and for varniſhes. Some writers relate, that the walls of Babylon, and the temple of Jeruſalem, were cemented with bitumen inſtead of mortar. This much is certain, that a true natural bitumen, that for inſtance which is found in the diſtrict of Neufchatel, proves an excellent cemen for walls, pavements, and other purpoſes, uncommonly firm, very durable in the air, and not penetrable by water. The watch and clock makers uſe a compoſition of aſphaltum, fine lamp-black, and oil of ſpike or turpentine, for drawing the black figures on dial-plates: this compoſition is prepared chiefly by certain perſons at Augſburg and Nuremberg.

(1.) * ASPHODEL. *n. ſ.* [*lilio-aſphodelus*, Lat.] Day-lily.—*Aſphodels* were by the ancients planted near burying-places, in order to ſupply the manes of the dead with nouriſhment.—

By thoſe happy ſouls who dwell
In yellow meads of *aſphodel*. *Pope.*

(2.) ASPHODEL, ASPHODELUS, or KING'S SPEAR. A genus of the monogynia order, belonging to the hexandria claſs of plants. The calyx is divided into 6 parts; and the nectarium conſiſts of 6 valves covering the nectarium. There are 5 ſpecies, viz.

1. ASPHODELUS ALBUS, the white aſphodel, with keel ſhaped leaves, hath roots compoſed of ſmall fibres, and knobs at bottom: the leaves are long, almoſt triangular, and hollow like the keel of a boat; the ſtalks ſeldom riſe above 2 feet high, and divide into ſeveral ſpreading branches: theſe are terminated by looſe ſpikes of white flowers.

2. ASPHODELUS LUTEUS, or common yellow aſphodel, hath roots compoſed of many thick fleſhy fibres, which are yellow, and joined to a head at the top; from whence ariſe ſtrong round ſingle ſtalks near three feet high, garniſhed on the upper part with yellow ſtar-ſhaped flowers which appear in June, and the ſeeds ripen in autumn.

3. ASPHODELUS NONRAMOSUS, or the unbranched aſphodel, hath roots like the ramoſus, (See N° 4.) but the leaves are longer and narrower; the ſtalks are ſingle, never putting out any ſide branches. The flowers appear at the ſame time with the former, are of a purer white, and grow in longer ſpikes.

4. ASPHODELUS RAMOSUS, or branching aſphodel, hath roots compoſed of fleſhy fibres, to each of which is faſtened an oblong bulb as large as a ſmall potatoe; the leaves are long and flexible, having ſharp edges; between theſe come out the flower-ſtalks, which ariſe more than three feet high, ſending forth many lateral branches.—The upper parts of theſe are adorned with many white ſtar-ſhaped flowers, which grow in long ſpikes flowering gradually upward. They come out in the beginning of June, and the ſeeds ripen in autumn.

5. ASPHODELUS STULOSUS, or annual branching ſpiderwort, hath roots compoſed of many yellow fleſhy fibres: the leaves are ſpread out from the crown of the root, cloſe to the ground, in a large cluſter; theſe are convex on their underſide, but plain above. The flower ſtalks riſe immediately from the root, and grow about 2 feet high, dividing into 3 or 4 branches upward, which are adorned with white ſtarry flowers, with purple lines on the outſide. Theſe flower in July and Auguſt, and their ſeeds ripen in October.

(6.) ASPHODELUS, CULTURE OF THE. The way to increaſe theſe plants is by parting their roots in Auguſt, before they ſhoot up their freſh green leaves. They may alſo be raiſed from ſeeds ſown in Auguſt; and the Auguſt following the plants produced from theſe may be tranſplanted into beds, and will produce flowers the ſecond year. They muſt not be planted in ſmall borders among tender flowers; for they will draw away all the nouriſhment, and ſtarve every thing elſe. The Lancaſhire aſphodel is thought to be very noxious to ſheep, whenever through poverty, of paſture, they are neceſſitated to eat it; although they are ſaid to improve much in their fleſh at firſt,

they

they afterwards die with ſymptoms of a diſeaſed liver. This is the plant of which ſuch wonderful tales have been told by Pauli, Bartholine; and others, of its ſoftening the bones of ſuch animals as ſwallow it; and which they thence called *gramen oſſifragum*. Horned cattle eat it without any ill effect.

ASPHURELATA, in natural hiſtory, are ſemimetallic foſſils, fuſible by fire, and not malleable in their pureſt ſtate, being in their native ſtate intimately mixed with ſulphur and other adventitious matter, and reduced to what are called *ores*. Of this ſeries of foſſils there are only five bodies, each of which makes a diſtinct genus; viz. antimony, biſmuth, cobalt, zinc, and quickſilver.

ASPHYXIA, [from α negative, and σφύξις, a pulſe,] among ancient phyſicians, a privation or ceſſation of the pulſe, through the whole body, and all its arteries. Strictly ſpeaking, no ſuch ceſſation can ever happen except in death; but in ſome caſes, the pulſe is ſo remiſs and languid, as not to be perceivable by the touch. Hence the aſphyxia is conſidered as an attendant of deep faintings, or deliquiums; and amounts to much the ſame with what is otherwiſe called *lypopſychia* or *ſyncope*. Mr Sage has lately publiſhed a treatiſe, recommending the volatile alkali fluor as the moſt effectual remedy in aſphyxies. ASPHYXIA is alſo uſed by ſome for a privation of pulſe in a part of the body, e. gr. in the arm, &c.

(1.) ASPIC, in botany, a plant which grows in plenty in Languedoc, in Provence, and eſpecially on the mountain of St Baume, in France. It is a kind of lavender, nearly like what grows in our gardens; both with regard to the figure and colour of its leaves and flowers. The botaniſts call it *lavendula mas*, or *ſpica nardi*, *pſeudo narbus*, &c.

(2.) * ASPICK. *n. ſ.* [See ASP.] The name of a ſerpent.—

Why did I 'ſcape th' invenom'd *aſpick's* rage,
And all the fiery monſters of the deſart,
To ſee this day? *Addiſon.*

ASPICUETA, Martin de, commonly called DOCTOR NAVARRUS, was deſcended of a noble family, and born in 1491, at Varaſayn, in Navarre. He entered very young into the monaſtery of regular canons at Roncevaux, where he took the habit, which he continued to wear after he left the convent. He ſtudied claſſical learning, natural and moral philoſophy, and divinity, at Alcala, in New Caſtile, adopting chiefly the ſyſtem of Petrus Lombardus. He ſtudied the law at Ferrara, and taught it with applauſe at Toulouſe and Cahors. After being firſt profeſſor of canon law at Salamanca for 14 years, he quitted that place to be profeſſor of law at Coimbra, with a larger ſalary. The duties of this office he diſcharged for the ſpace of 20 years, and then reſigned it to retire into his own country where he took care of the daughters of his deceaſed brothers. Having made a journey to Rome to plead the cauſe of Bartholomeo de Caranza archbiſhop of Toledo, who had been accuſed of hereſy before the tribunal of the inquiſition in Spain, and whoſe cauſe was, by the Pope's order, to be tried in that city, Aſpicueta's writings, which were well known, procured him a moſt honourable reception. Pope Pius V. made him aſſiſtant to cardinal Francis Aciat, his vice-penitentiary; and Gregory XIII. never paſſed by his door without calling for him, and ſtopped ſometimes a whole hour to talk with him in the ſtreet. His name became ſo famous, that even in his lifetime the higheſt encomium on a learned man was to call him a *Navarrus*. He was conſulted as an oracle. By temperance he prolonged his life to a great length. His œconomy enabled him to give ſubſtantial proof of his charity. Being very old, he uſed to ride through the city, and relieve all the poor he met; to which his mule was ſo well accuſtomed, that it ſtopped of his own accord at the ſight of every poor man till its maſter had relieved him.—He refuſed ſeveral honourable poſts in church and ſtate, that he might have leiſure to correct and improve the works he had written, and compoſe others. He died in 1586, aged 94. He wrote many treatiſes on morality and canon law.

ASPILATES, or ASPLENITES, in the writings of the ancients, the name of a ſtone, famous for its virtues againſt the ſpleen, and many other diſorders; it was to be applied externally, and faſtened to the part with camel's hair.

ASPINY, or ANGLIARY-THORN, a drug uſed in medicine, on which particular duties are impoſed, by the tariff of the cuſtom-houſe at Lyons.

(1.) * ASPIRATE. *adj.* [*aſpiratus*, Lat.] Pronounced with full breath.—For their being previous, you may call them, if you pleaſe, periſpirate: but yet they are not *aſpirate*, i. e. with ſuch an aſpiration as *h*. *Holder*.

(2.) ASPIRATE, in grammar, denotes words marked with the ſpiritus aſper. See ASPER, N° 3.

(1.) * *To* ASPIRATE. *v. a.* [*aſpiro*, Lat.] To pronounce with aſpiration, or full breath; as we aſpirate *horſe*, *houſe*, and *hog*.

(2.) * *To* ASPIRATE. *v. n.* [*aſpiro*, Lat.] To be pronounced with full breath.—Where a vowel ends a word, the next begins either with a conſonant, or what is its equivalent; for our *w* and *h aſpirate*. *Dryden*.

* ASPIRATION. *ſ. f.* [*aſpiratio*, Lat.] 1. A breathing after; an ardent wiſh: uſed generally of a wiſh for ſpiritual bleſſings.—A ſoul inſpired with the warmeſt *aſpirations* after celeſtial beatitude, keeps its power attentive. *Watts*. 2. The act of aſpiring, or deſiring ſomething high and great.—

'Tis he; I ken the manner of his gate;
He riſes on his toe; that ſpirit of his
In *aſpiration* lifts him from the earth. *Shakeſp.*

3. The pronunciation of a vowel with full breath.—*H* is only a guttural *aſpiration*, i. e. a more forcible impulſe of the breath from the lungs. *Holder*.

* *To* ASPIRE. *v. n.* [*aſpiro*, Lat.] 1. To deſire with eagerneſs; to pant after ſomething higher: ſometimes with the particle *to*.—

Aſpiring to be gods, if angels fell,
Aſpiring to be angels, men rebel. *Pope.*

2. Sometimes with *after*.—Thoſe are raiſed above ſenſe, and *aſpire after* immortality, who believe the perpetual duration of their ſouls. *Tillotſon.*—3. To riſe; to tower.—

My own breath ſtill foment the fire,
Which flames as high as fancy can *aſpire*.
Waller.

* ASPIRER

* ASPIRER. *n. f.* [from *aſpire.*] One that ambitiouſly ſtrives to be greater then he is.—

They ween'd
To win the mount of God; and on his throne,
To ſet the envier of his ſtate, the proud
Aſpirer; but their thoughts prov'd fond and vain. *Milton.*

ASPIUS, in ichthyology, a ſpecies of the cyprinus, belonging to the abdominal order. It is met with in the lakes of Sweden.

ASPLENITES. See ASPILATES.

* ASPORTATION. *n. f.* [*aſportatio*, Lat.] A carrying away. *Dict.*

* ASQUINT. *adv.* [from *a* and *ſquint.*] Obliquely; not in the ſtrait line of viſion.—A ſingle guide may direct the way better than five hundred, who have contrary views, or look *aſquint*, or ſhut their eyes. *Swift.*

ASRAEL, the angel, according to the Mahometan ſyſtem, who is appropriated to take care of the ſouls of thoſe who die.

(1.) * ASS. *n. f.* [*aſinus*, Lat.] 1. An animal of burden, remarkable for ſluggiſhneſs, patience, hardineſs, coarſeneſs of food, and long life.—

You have among you many a purchas'd ſlave,
Which like your *aſſes*, and your dogs and mules,
You uſe in abject and in ſlaviſh part,
Becauſe you bought them. *Shakeſpeare.*

2. A ſtupid, heavy, dull fellow; a dolt.—I do begin to perceive that I am made an *aſs*. *Shakeſ.*

(2.) Ass, in zoology. See EQUUS.

(3.) Ass, CORONATION OF THE, in antiquity, was a part of the ceremony of the feaſt of Veſta, wherein the bakers put crowns on the heads of theſe quadrupeds; *Ecce coronatis panis dependet aſellis!* Hence, in an ancient calendar, the ideas of June are thus denoted; *Feſtum eſt Veſtæ. Aſinus coronatur!*—This honour, it ſeems, was done the beaſt, becauſe, according to the mythology, by its braying, it had ſaved Veſta from being raviſhed by the Lampſacan god: Hence the formula, *Veſtæ delicium eſt aſinus.*

ASSABA, the name given by the people of Guinea to a ſhrub which they boil in water, and rub on a bubo, and it proves a cure.

ASSAC, or ASSAX, in the materia medica of the ancients, the name given by the Arabians to the gum ammoniac of the Greeks; but by many of the qualities attributed to this drug, it does not appear to be the ſame that is now called ſo.

ASSACH, or ASSATH, a kind of purgation, anciently uſed in Wales, by the oaths of 300 men.

ASSA DULCIS. See BENZOIN.

ASSA FOETIDA. See ASA, N° II. § 4 and 5.

ASSAI, in muſic, ſignifies quick; or according to others, that the motion of the piece be kept in a middle degree of quickneſs or ſlowneſs: As, *aſſai allegro, aſſai preſto.* See ALLEGRO and PRESTO.

* *To* ASSAIL. *v. a.* [*aſſailler*, Fr.] 1. To attack in a hoſtile manner; to aſſault; to fall upon; to invade.—

So when he ſaw his ſlatt'ring arts to fail,
With greedy force he 'gan the fort t' *aſſail.*
Fairy Queen.

2. To attack with argument; cenſure; or motives applied to the paſſions.—

In vain Thaleſtris with reproach *aſſails*;
For who can move when fair Belinda fails?
Pope.

* ASSAILABLE. *adj.* [from *aſſail.*] That which may be attacked.—

Banquo, and his Fleance, lives.——
But in them nature's copy's not eternal.—
There's comfort yet, they are *aſſailable. Shak.*

(1.) * ASSAILANT. *adj.* Attacking; invading.

And as ev'ning dragon came,
Aſſailant on the perched roofts
Of tame villatick fowl. *Milton.*

(2.) * ASSAILANT. *n. f.* [*aſſaillant*, Fr.] He that attacks; in oppoſition to *defendant.*—The ſame was ſo well encountered by the defendants, that the obſtinacy of the *aſſailants* did but increaſe the loſs. *Hayward.*—

* ASSAILER. *n. f.* [from *aſſail.*] One who attacks another.—Palladius heated, ſo purſued our *aſſailers*, that one of them ſlew him. *Sidney.*

ASSAM, a country of Aſia, bounded on the W. by Bengal and Bootan; on the N. by the mountains of Thibet and on the SE. and S. by Meckley. The Burrampooter runs through the whole length of it. Gerghon is the capital. Aſſam lies between Lon. 91° and 96° and between Lat. 25° and 80° N.

ASSAMESE, the inhabitants of Aſſam. They are fond of the fleſh of dogs. They live comfortably, however; and as their king is ſole proprietor of all the gold, ſilver, and other metals in his kingdom, they pay no taxes. The invention of gun powder is by ſome aſcribed to them.

ASSANCALA, } a ſtrong town in Armenia,
ASSANCALE, } near the river Arras, in the road between Erzerum and Erivan, noted for its hot baths. It ſtands on a high hill, 22 m. E. of Erzerum; the walls are built in a ſpiral line all round the rock, and ſtrengthened with ſquare towers. The ditches are about two fathoms over, cut out of hard rock. Lon. 41. 10. E. Lat. 39. 46. N.

ASSANCHIF, a town of Aſia in Diarbekir, ſeated on the Tigris, 40 miles SE. of Diarbekir. Lon. 42. 30. E. Lat. 37. 20. N.

ASSANDUM. See ASHOWN.

ASSANS. See ASSENS.

* ASSAPANICK. *n. f.* A little animal of Virginia, which is ſaid to fly by ſtretching out its ſhoulders and its ſkin, and is called in Engliſh the flying ſquirrel. *Trevoux.*

ASSAPOORY, in natural hiſtory, a name given by the people of the Eaſt Indies to a peculiar ſpecies of ſlate, which they uſe in medicine, reducing it to powder, and ſtrewing it on burning coals, that the ſick perſon may receive the fumes of it. It is principally uſed for children, when they are diſordered by taking cold. The ſmell of it, while burning, is very offenſive.

ASSARABACCA. See ASARABACCA, and ASARUM, § I.

ASSARIUM, a ſmall copper coin, being a part of the *as.* The word is uſed by Suidas indifferently with ὀβολὸς, and νομισμα, to denote a ſmall piece of money; in which he is followed by Cujacius, who defines ασσαριον, by *minimus æris nummus.* We find mention of the *aſſarion* in Matthew, chap. x. ver. 29. tranſlated, a farthing.

ASSARON,

ASSARON, an ancient Jewiſh meaſure of capacity, equal to the tenth part of an ephah. The aſſaron is the ſame with the *omer*. Joſephus calls it ἰσοτης; in the Hebrew it is written *aſſurith*. It was the meaſure of manna appointed for each perſon.

* ASSART. *n. ſ.* [*eſſart*, from *eſſarter*, Fr. to clear away wood in a foreſt.] An offence committed in the foreſt, by plucking up thoſe woods by the roots, that are thickets or coverts of the foreſt, and by making them as plain as arable land. *Cowel.*

* *To* ASSART. *v. a.* [*aſſartir*, Fr.] To commit an aſſart. See ASSART.

(1.) * ASSASSIN, ASSASSINATE. *n. ſ.* [*aſſaſſin*, Fr. a word brought originally from Aſia, where, about the time of the holy war, there was a ſet of men called *aſſaſſins*, as is ſuppoſed for *Arſacidæ*, who killed any man without regard to danger, at the command of their chief.] A murderer; one that kills by treachery, or ſudden violence.—In the very moment as the knight withdrew from the duke, this *aſſaſſinate* gave him, with a back blow, a deep wound into his left ſide. *Wotton.*

(2.) ASSASSIN, DERIVATIONS OF, &c. The word *aſſaſſin* is ſaid to have taken its riſe from a prince of the family of the *Arſacidæ*, popularly called *Aſſaſins*, who lived in a caſtle between Antioch and Damaſcus, and brought up a number of young men, ready to pay a blind obedience to his commands; whom he employed in murdering the princes with whom he was at enmity. But according to Mr Volney, the word *Haſſaſſin* (from the root *baſis*, to kill, to aſſaſſinate, to liſten, to ſurpriſe,) in the vulgar Arabic ſignifies Robbers of the night, perſons who *lie in ambuſh to kill*; and is very univerſally underſtood in this ſenſe at Cairo and in Syria. Hence it was applied to the *Batenians*, who ſlew by ſurpriſe. See ASSASSINS, § 1 and 2. There was a certain law of nations, received in all the republics of Greece and Italy, whereby he that aſſaſſinated an uſurper of the ſupreme power was declared a virtuous man. At Rome eſpecially, after the expulſion of the kings, the law was formal and ſolemn, and inſtances of it admitted. The commonwealth armed the hand of any citizen, and created him magiſtrate for that moment.

* ASSASSINATE. *n. ſ* [from *aſſaſſin*.] The crime of an aſſaſſin; murder.—Were not all *aſſaſſinates* and popular inſurrections wrongfully chaſtiſed, if the meanneſs of the offenders indemnified them from puniſhment? *Pope.*

* *To* ASSASSINATE. *v. a.* [from *aſſaſſin*.] 1. To murder by violence.—Help, neighbours, my houſe is broken up by force, and I am raviſhed, and like to be *aſſaſſinated*. *Dryden.* 2. To way-lay; to take by treachery. This meaning is perhaps peculiar to Milton.—

Such uſage as your honourable lords
Afford me, *aſſaſſinated* and betray'd,
Who durſt not, with your whole united pow'rs,
In fight withſtand one ſingle and unarm'd. *Milt.*

* ASSASSINATION. *n. ſ.* [from *aſſaſſinate*.] The act of aſſaſſination; murder by violence.—

It were done quickly, if th' *aſſaſſination*
Could trammel up the conſequence. *Shak.*

* ASSASSINATOR. *n. ſ.* [from *aſſaſſinate*.] Murderer; mankiller; the perſon that kills another by violence.

(1.) ASSASSINS, a tribe or clan in Syria, called alſo ISMAELIANS and BATANISTS, or BATENIANS. Theſe people probably owed their origin to the Karmatians, a famous heretical ſect among the Mahometans, who ſettled in Perſia about the year 1090; whence, in proceſs of time, they ſent a colony into Syria, where they became poſſeſſed of a conſiderable tract of land among the mountains of Lebanon, extending itſelf from the neighbourhood of Antioch to Damaſcus.

(2.) ASSASSINS, HISTORY OF THE. The firſt chief and legiſlator of this extraordinary tribe appears to have been Haſſan Sabah, a ſubtle impoſtor, who by his artifices made fanatical and implicit ſlaves of his ſubjects. Their religion was compounded of that of the Magi, the Jews, the Chriſtians and the Mahometans: but the capital article of their creed was to believe that the Holy Ghoſt reſided in their chief; that his orders proceeded from God himſelf, and were real declarations of his divine pleaſure. To this monarch the orientals gave the name of *Scheik*: but he is better known in Europe by the name of the *Old Man of the Mountain*. His dignity inſtead of being hereditary, was confirmed by election; where merit, that is, a ſuperior multiplicity and enormity of crimes, was the moſt effectual recommendation to a majority of ſuffrages. This chief, from his exalted reſidence on the ſummit of mount Lebanon, like a vindictive deity, with the thunderbolt in his hand, ſent inevitable death to all quarters of the world; ſo that from one end of the east to the other, khaliffs, emperors, ſultans, kings, princes, Chriſtians, Mahometans and Jews, every nation and people, execrated and dreaded his ſanguinary power, from the ſtrokes of which there was no ſecurity. At the leaſt ſuggeſtion or whiſper, that he had threatened the death of any potentate, all immediately doubled their guards, and took every precaution in their power. Philip Auguſtus king of France, on advice that the Scheik intended to have him aſſaſſinated, inſtituted a new body-guard of men diſtinguiſhed for their activity and courage, called *ſergens d' Armes*, with bows clubs, bows and arrows; and he himſelf never appeared without a club, fortified either with iron or gold. Moſt ſovereigns paid ſecretly a penſion to the Scheik, however ſcandalous and derogatory it might be to the luſtre of majeſty, for the ſafety of their perſons. The Knights Templars alone dared to defy his ſecret machinations and open force. Indeed they were a permanent diſperſed body, not to be cut off by maſſacres or aſſaſſinations. This barbarous prince was furniſhed with reſources unknown to all other monarchs, even to the moſt abſolute deſpotic tyrants. His ſubjects would proſtrate themſelves at the foot of his throne, requeſting to die by his hand or order, as a favour by which they were ſure of paſſing to paradiſe. On them if danger made any impreſſion, it was an emulation to preſs forward; and if taken in any enterpriſe, they went to the place of execution with a magnanimity unknown to others. Henry count of Champaigne, who married Iſabella daughter of Amury king of Jeruſalem, paſſed over part of the territory of the Aſſaſſins as a

to Syria, and talking highly of his power, r chief came to meet him, "Are your ſubjects l the old man of the mountain) as ready in r ſubmiſſion as mine?" and, without ſtaying an anſwer, made a ſign with his hand, when ten ng men in white, who were ſtanding on an adnt tower, inſtantly threw themſelves down. another occaſion, Sultan Malek-Shah ſumning the Scheik to ſubmit himſelf to his governit, and threatening him with the power of his s, ſhould he heſitate to comply; the latter, compoſedly turning himſelf towards his rds, ſaid to one of them, "Draw your dagand plunge it into your breaſt;" and to ano-, "Throw yourſelf headlong from yonder k." His orders were no ſooner uttered than were joyfully obeyed: and all the anſwer he ned to give the ſultan's envoy was, "Away hy maſter, and let him know I have many uſand ſubjects of the ſame diſpoſition." Men eady to deſtroy themſelves were equally alert reſolute in being the miniſters of death to o-s. At the command of their ſovereign, they le no difficulty of ſtabbing any prince, even on throne; and being well verſed in the different ects, they conformed to the dreſs and even the rnal religion of the country, that they might leſs difficulty ſtrike the fatal blow required heir chief. With the Saracens they were Maetans; with the Franks, Chriſtians; in one e they joined with the Mamaluks; in ano-, with the eccleſiaſtics or religious; and unthis diſguiſe ſeized the firſt opportunity of exing their ſanguinary commiſſion. Of this we t with an inſtance in the hiſtory of Saladin, le he was beſieging Manbedge, the celebrated rapolis of antiquity. Being one day, with a attendants, and they at ſome diſtance, reconring the place for the better diſpoſition of the ck, a man ruſhed on him with a dagger in his d, and wounded him in the head; but the ſulas he was endeavouring to repeat his ſtroke, ſted the dagger from him, and, after receiving ral wounds, laid him dead at his feet. Before ſultan had well recovered himſelf, a ſecond entered him to finiſh the treachery of the for-; but he met with the ſame fate: he was ſucded with equal fury by a third, who alſo fell the hand of that magnanimous prince whom was ſent to aſſaſſinate. And it was obſerved, theſe wretches dealt about their fruitleſs blows hey lay in the agonies of death. With ſuch idity was this tranſacted, that it was over be- Saladin's guards could come to his aſſiſtance. retired to his tent, and in great perturbation wing himſelf on his ſopha, ordered his ſerts to take a ſtrict view of his houſehold, and ſuſpect all ſuſpected perſons; at the ſame time ng with great earneſtneſs, "Of whom have I rved ſuch treacherous uſage?" But it afterds appeared, that theſe villains had been ſent the old man of the mountain; of whom the r Kamſchlegin had purchaſed the murder of din, to free himſelf from ſo great a warrior om he could not meet in the field. To animate n their frantic obedience, the Scheik, be- their departure on ſuch attempts, uſed to them a ſmall foretaſte of ſome of the delights

which he aſſured them would be their recompenſe in paradiſe. Delicious ſoporific drinks were given them; and while they lay aſleep, they were carried into beautiful gardens, where every allurement invited their ſenſes to the moſt exquiſite gratifications. From theſe ſeats of voluptuouſneſs, inflamed with liquor and enthuſiaſtic views of perpetual enjoyments, they ſallied forth to perform aſſaſſinations of the blackeſt dye. This people once had, or at leaſt they pretended to have, an intention of embracing the Chriſtian religion. They reigned a long time in Perſia and on Mount Lebanon. In 1213, they aſſaſſinated Lewis of Bavaria. Hulakn, a khan of the Mogul Tartars, in the year 655 of the Hegira, or 1254 of the Chriſtian æra, entered their country and diſpoſſeſſed them of ſeveral places. In 1257, the Tartars conquered them and killed their prince; but it was not till 1272, that they were totally extirpated. This atchievement was owing to the conduct and intrepidity of the Egyptian forces ſent againſt them by the ſultan Bibaris. It has, however, been thought that the Druſes, who ſtill reſide among the eminences of Mount Lebanon, and whoſe religion and cuſtoms are ſo little known, are a remnant of thoſe barbarians.

ASSATH. See ASSACH.

* ASSA'TION, *n. ſ.* [*aſſatus*, roaſted, Latin.] Roaſting.—The egg expiring leſs in the elixation or boiling; whereas, in the *aſſation* or roaſting, it will ſometimes abate a drachm. *Brown's Vulg. Er.*

(1.) * ASSAULT. *n. ſ.* [*aſſault*, French.] 1. Attack; hoſtile onſet: oppoſed to *defence*.—Her ſpirit had been invincible againſt all *aſſaults* of affection. *Shakeſpeare.* 2. Storm; oppoſed to *ſap* or *ſiege*.—Jaſon took at leaſt a thouſand men, and ſuddenly made an *aſſault upon* the city. 2. *Mac.* v. 5. 3. Hoſtile violence.—

Themſelves at diſcord fell,
And cruel combat join'd in middle ſpace,
With horrible *aſſault*, and fury fell. *Fairy Queen.*

4. Invaſion; hoſtility; attack.—After ſome unhappy *aſſaults upon* the prerogative by the parliament, which produced its diſſolution, there followed a compoſure. *Clarendon.* 5. In law.—A violent kind of injury offered to a man's perſon. It may be committed by offering of a blow, or by a fearful ſpeech. *Cowel.* 6. It has *upon* before the thing aſſaulted.

(2.) ASSAULT, in law, is an attempt or offer to beat another, without touching him: as if one lifts up his cane or his fiſt in a threatening manner at another; or ſtrikes at him, but miſſes him; this is an aſſault, *inſultus*, which Finch deſcribes to be "an unlawful ſetting upon one's perſon." This alſo is an inchoate violence, amounting conſiderably higher than bare threats; and therefore, though no actual ſuffering is proved, yet the party injured may have redreſs by action of *treſpaſs vi et armis*, wherein he ſhall recover damages as a compenſation for the injury.

(3.) ASSAULT, in the military art, a furious effort made to carry a fortified poſt, camp, or fortreſs, wherein the aſſailants do not ſcreen themſelves by any works: while the aſſault continues, the batteries ceaſe, for fear of killing their own men. The *enfans perdus* march firſt to the aſſault. See ENFANS PERDUS.

* *To* ASSAULT. *v. a.* [from the noun.] To attack; to invade; to fall upon with violence.—The king granted the Jews to gather themſelves together, and to ſtand for their life, to deſtroy all the power that would *aſſault* them. *Eſth.* viii. 11.

* ASSAULTER. *n. ſ.* [from *aſſault.*] One who violently aſſaults another.—Neither liking their eloquence, nor fearing their might, we eſteemed few ſwords in a juſt defence, able to reſiſt many unjuſt *aſſaulters*. *Sidney.*

ASSAX. See ASSAC.

(1.) * ASSAY. *n. ſ.* [*eſſaye*, Fr. from which the ancient writers borrowed *eſſays*, according to the ſound, and the latter, *eſſay*, according to the writing; but the ſenſes now differing, they may be conſidered as two words.] 1. Examination; trial.

This cannot be
By no *eſſay* of reaſon. 'Tis a pageant,
To keep us in falſe gaze. *Shakeſpeare.*

2. In law. The examination of meaſures and weights uſed by the clerk of the market. *Cowel.* 3. The firſt entrance upon any thing; a taſte for trial.—

For well he weened, that ſo glorious bait,
Would tempt his gueſt to take thereof *aſſay*.
Fairy Queen.

4. Trial by danger or diſtreſs; difficulty; hardſhip.—

She heard with patience all the end,
And ſtrove to maſter ſorrowful *aſſay*. *Fairy Q.*

(2.) ASSAY, ESSAY, or SAY, in metallurgy, the proof or trial of the goodneſs, purity, value, &c. of metals and metalline ſubſtances. See ESSAY. In ancient ſtatutes, that is called the *touch*; and thoſe who had the care of it, *Keepers of the Touch*. Under Henry VI. divers cities were appointed to have touch for wrought ſilver plate, 2 Henry VI. c. 14. By this, one might imagine that they had no better method of aſſaying than the ſimple one by the touch ſtone; but the caſe was far otherwiſe. In the time of king Henry II. the biſhop of Saliſbury, then treaſurer, conſidering, that though the money paid into the king's exchequer, for his crown rents, did anſwer *numero et pondere*, (in number and weight, it might nevertheleſs be mixed with copper or braſs: wherefore a conſtitution was made, called the *trial by combuſtion*; which differs little or nothing from the preſent method of aſſaying ſilver. See a deſcription of it in the Black Book in the Exchequer, written by Gervaſe of Tilbury, c. xxi. This trial is alſo there called *eſſaium*, and the officer who made it is named *aſſor*. The method ſtill in uſe of aſſaying gold and ſilver was firſt eſtabliſhed by an act of the Engliſh parliament, in 1354.

* *To* ASSAY. *v. a.* [*eſſayer*, Fr.] 1. To make trial of; to make experiment of.—What unweighed behaviour hath this drunkard picked out of my converſation that he dares in this manner *aſſay* me? *Shakeſpeare.* 2. To apply to, as the touch-ſtone in *aſſaying* metals.—

Whom thus afflicted, when ſad Eve beheld,
Deſolate where ſhe ſat, approaching nigh,
Soft words to his fierce paſſion ſhe *aſſay'd*:

Milton.

3. To try; to endeavour.—David girded his ſword upon his armour, and he *aſſayed* to go, for he had not proved it. 1 *Sam.* xvii. 39.

* ASSAYER. *n. ſ.* [from *aſſay.*] An officer of the mint, for the trial of ſilver, appointed between the maſter of the mint and the merchants that bring ſilver thither for exchange. *Cowel.*—The ſmelters come up to the *aſſayers* within one in twenty. *Woodward on Foſſils.*

ASSAYING, ARS DOCIMASTICA, in its extent, comprehends particular manners of examining every ore, or mixed metal, according to its nature, with the beſt adapted fluxes; ſo as to diſcover, not only what metals, and what proportions of metal, are contained in ores; but likewiſe how much ſulphur, vitriol, alum, arſenic, ſmalt, &c. may be obtained from every one reſpectively.—See BLOW-PIPE, METALLURGY, and MISSALOGY. Aſſaying is particularly uſed by coiners and goldſmiths, for trying the purity of the gold and ſilver to be uſed in the coining of money, and manufacture of plate, &c. or that have been already uſed therein. There are two kinds of aſſaying; the one before metals are melted, in order to bring them to their proper fineneſs; the other after they are ſtruck, to ſee that they be ſtandard. For the firſt aſſay, the aſſayers uſe to take 14 or 15 grains of gold, and half a dram of ſilver, if it be for money; and 18 grains of the one, and a dram of the other, if for other purpoſes. The ſecond is made of one of the pieces of money coined, which they cut in four parts; or by ſcraping a ſmall quantity of a piece of work. The quantity of gold for an aſſay among us is 15 grains; in France, nearly the ſame; and in Germany, about three times as much. See ESSAY.

ASSAY-MASTER, or ESSAY-MASTER, an officer entruſted with the care of making true touch, or aſſay, of the gold and ſilver brought to him; and giving a juſt report of the goodneſs or badneſs thereof. Such is the aſſay-maſter of the mint, called alſo the king's aſſay-maſter; which, in Scotland, has been a ſinecure office ſince the Union. The aſſay-maſter of the goldſmiths company in London is a ſort of aſſiſtant warden, called alſo a *touch warden*, appointed to ſurvey, aſſay, and mark all the ſilver work, &c. committed to him. There are alſo aſſay-maſters appointed by ſtatute at York, Exeter, Briſtol, Cheſter, Norwich, Newcaſtle, and Birmingham, for aſſaying wrought plate. The aſſay-maſter is to retain 8 grains of every pound Troy of ſilver brought to him; 4 whereof are to be put in the pix, or box of deal, to be re-aſſayed the next year, by way of check upon him; and the other 4 to be allowed him for waſte, in aſſaying. The number of pennyweights ſet down in the aſſay-maſter's report, is to be accounted ſo much in every pound of 12 ounces Troy. For every 20 pennyweights, or ounce Troy, the ſilver is found by the aſſay to be worſe than ſtandard, or ſterling, ſixpence is to be deducted; becauſe every ounce will coſt ſo much to reduce it to ſtandard goodneſs, or to change it for ſterling. In gold, for every carat it is worſe than ſtandard, it is accounted, in the ounce Troy, worſe by ſo many times 3*l.* 6*d.*

and for every grain it is ſet down worſe, it is accounted worſe by ſo many times 11 d. in the ounce Troy; and for every half grain 6½ d.: for ſo much it will coſt to make it of ſtandard goodneſs, &c. The incorporation of goldſmiths in Edinburgh have two aſſay-maſters, who are annually elected (or re-elected) from among their own members, and are ſworn to do juſtice to the public.

* ASSECTATION. *n. ſ.* [*aſſectatio*, Lat.] Attendance, or waiting upon. *Dict.*

ASSAYSIARE, in law, to take aſſeſſors.

* ASSECUTION. *n. ſ.* [from *aſſequor*, *aſſecutum*, to obtain.] Acquirement; the act of obtaining.—By the canon law, a perſon, after he has been in full poſſeſſion of a ſecond benefice, cannot return again to his firſt; becauſe it is immediately void by his *aſſecutum* of a ſecond. *Ayliffe.*

ASSEDATION, a taxing of the king's farms.

ASSELANI. See ASLAN.

ASSELYN, John, a famous Dutch painter, born in Holland, and the diſciple of Iſaiah Vandevelde, the battle-painter. He diſtinguiſhed himſelf in hiſtorical pieces, battles, landſcapes, animals, and particularly horſes. He travelled into France and Italy; and was ſo pleaſed with the manner of Bombochio, that he always followed it. He firſt diſcovered to his countrymen a clear manner of painting landſcapes, like Claude Lorraine; inſtead of the dark brown they had hitherto followed. Aſſelyn's pictures were much admired at Amſterdam, and ſold at high prices. He died in that city in 1660.

(1.) * ASSEMBLAGE. *n. ſ.* [*aſſemblage*, Fr.] 1. A collection; a number of individuals brought together. It differs from *aſſembly*, by being applied only, or chiefly, to things: *aſſembly* being uſed only, or generally, of perſons.—All that we amaſs together in our thoughts is poſitive ideas of ſpace or duration. *Locke.* 2. The ſtate of being aſſembled.—

O Hartford, fitted or to ſhine in courts
With unaffected grace, or walk the plains,
With innocence and meditation join'd
In ſoft *aſſemblage*, liſten to my ſong! *Thomſon.*

(2.) ASSEMBLAGE ſignifies, likewiſe, the things themſelves ſo united. It is alſo uſed, in a more general ſenſe, for a collection of various things ſo diſpoſed and diverſified, that the whole produces ſome agreeable effect.

(1.) * *To* ASSEMBLE. *v. a.* [*aſſembler*, Fr.] To bring into one place. It is uſed both of perſons and things.—And he ſhall ſet up an enſign for the nations, and ſhall *aſſemble* the outcaſts of Iſrael, and gather together the diſperſed of Judah. *Iſaiah*, xi. 12.

(2.) * *To* ASSEMBLE. *v. n.* To meet together.—Theſe men *aſſembled* and found Daniel praying. *Daniel.*

(1.) ASSEMBLIES of the clergy are called *convocations*, *ſynods*, *councils*. The annual meeting of the church of Scotland is called a *General Aſſembly*: In this aſſembly his Majeſty is repreſented by his Commiſſioner, who diſſolves one meeting, and calls another, in the name of the *King*, while the Moderator does the ſame in the name of the *Lord Jeſus Chriſt*.

(2.) ASSEMBLIES of the Roman people were called *comitia*.

(3.) ASSEMBLIES OF THE STATES. Under the Gothic governments, the ſupreme legiſlative power was lodged in an aſſembly of the ſtates of the kingdom, held annually for the like purpoſes as our parliaments. In Great Britain and Sweden, ſuch aſſemblies retain their ancient powers and privileges. There were ſome feeble remains of them in France and Poland before the late revolutions and counter-revolutions.

(4.) * ASSEMBLY. *n. ſ.* [*aſſemblee*, Fr.] A company met together.—

They had heard, by fame,
Of this ſo noble, and ſo fair *aſſembly*,
This night to meet here. *Shakeſpeare.*

(5.) ASSEMBLY, in the beau monde, an appointed meeting of faſhionable perſons of both ſexes, for the ſake of play, dancing, gallantry, converſation, &c.

(6.) ASSEMBLY, in the military art, the ſecond beating of a drum before a march; at which the ſoldiers ſtrike their tents, roll them up, and ſtand to arms.

ASSENIPI, one of the united States of America, newly added to the union.

(1.) ASSENS, a diſtrict of Denmark, in the province of Funen, which carries on a conſiderable trade in corn and other productions of the country. It is alſo called *Aſnes*, which ſignifies the holy promontory. A battle was fought in it, in 1535, wherein Chriſtian III. obtained a deciſive victory over Chriſtian II.

(2.) ASSENS, a ſea-port town of Denmark, ſituated upon the Little Belt, a ſtrait of the Baltic, which ſeparates the iſle of Funen from the continent. It is the common paſſage from the duchy of Sleſwick to Copenhagen. Lon. 10. 30. E. Lat. 55. 15. N.

(1.) * ASSENT. *n. ſ.* [*aſſenſus*, Lat.] 1. The act of agreeing to any thing.—All the arguments on both ſides muſt be laid in balance, and, upon the whole, the underſtanding determines its *aſſent*. *Locke.* 2. Conſent; agreement.—To urge any thing upon the church, requiring thereunto that religious *aſſent* of chriſtian belief, wherewith the words of the holy prophets are received, and not to ſhow it in ſcripture; this did the Fathers evermore think unlawful, impious, and execrable. *Hooker.*

(2.) ASSENT, like faith, is divided into *implicit* and *explicit*; *actual* and *habitual*, &c. See FAITH.

1. ASSENT, ACTUAL, is a determination of the mind, ariſing from the perception of the truth of any propoſition.

2. ASSENT, HABITUAL, conſiſts in certain habits of believing or acquieſcing, induced in the mind by repeated acts.

(3.) ASSENT, ROYAL, the approbation given by the king to a bill in parliament, after which it becomes a law.

* *To* ASSENT. *v. n.* [*aſſentire*, Lat.] To concede; to yield to, or agree to.—And the Jews alſo *aſſented*, ſaying, that theſe things were ſo. *Acts.*

ASSENTAMEN, a Virginian pink. *Bailey.*

* ASSENTATION. *n. ſ.* [*aſſentatio*, Lat.]

Compliance with the opinion of another out of flattery or diſſimulation.

ASSENTATORY, belonging to flattery.

* ASSENTMENT. *n. ſ.* [from *aſſent.*] Conſent.—Their arguments are but precarious, and ſubſiſt upon the charity of our *aſſentments. Brown.*

ASSER, John, or ASSERIUS MENEVENSIS, (*i. e.* Aſſer of St David's,) biſhop of Shirburn, in the reign of Alfred the Great. He was born in Pembrokeſhire, in S. Wales; and educated in the monaſtery of St David's by the archbiſhop of Aſſerius, who, according to Leland, was his kinſman. By his aſſiduous application he ſoon acquired univerſal fame as a perſon of profound learning and great abilities. Alfred the munificent patron of genius, about the year 880, ſent for him to court; then held at Dean in Wiltſhire. He was ſo charmed with Aſſer, that he made him his preceptor and companion; appointed him abbot of 2 or 3 different monaſteries; and at laſt promoted him to the ſee of Shirburn, where he died in 910. He was a man of happy genius, wonderful modeſty, extenſive learning, and great integrity. He is ſaid to have been principally inſtrumental in perſuading the king to reſtore the univerſity of Oxford to its priſtine dignity.—He wrote, *De vita et rebus geſtis Alfredi*, &c. Lond. 1574, publiſhed by Archbiſhop Parker, in the old Saxon character, at the end of *Walſinghami hiſt.*—Francf. 1602, fol. Oxf. 1722, 8vo. Many other works are aſcribed to this author by Gale, Bale, and Pits; but all doubtful.

ASSERAC, among the Turks. See ASSIS.

ASSERIA, ASSESIA, or ASISIA, an ancient town of Liburnia, now in ruins. The veſtiges of the walls of Aſſeria that ſtill remain, and whoſe circumference is clearly diſtinguiſhable above ground, meaſure 3600 Roman feet. The ſpace incloſed by them forms an oblong polygon, and they are built with Dalmatian marble; but not taken from the hill on which they ſtand, for that furniſhes only ſoft ſtone. The walls are inveſted, both inſide and out, with this marble: ſome of the ſtones are ten feet long, and they are all of conſiderable dimenſions. The thickneſs of theſe fortifications is commonly about 8 feet: but at the narroweſt extremity, which falls towards the foot of the hill, they are 11 feet thick; and, in ſome parts, their height ſtill above ground reaches to near 30 feet. An antiquary, or even a ſimple lover of erudition, (the Abbe Fortis obſerves,) cannot help wiſhing at PODGRAJE (the modern name of Aſſeria), that ſome powerful hand *quicquid ſub terra eſt in apricum proferit:* and ſuch a wiſh becomes ſtronger when he reflects, that ſince the deſtruction of that city no ſearch has ever been made under ground, with a view to diſcover any thing curious; and yet theſe walls doubtleſs contain a valuable depoſite of antiquities, thrown down in heaps, who knows by what cauſe; perhaps naturally, by an earthquake, or perhaps by a ſudden inundation of barbarians, which is ſtill worſe. The gate now demoliſhed, the conſiderable height of the walls to be ſeen in ſeveral places from without, ſome pieces of thick walls that ſtill appear levelled to the ground among the buſhes, are circumſtances which give ground to hope that many coſtly monuments might be recovered out of theſe ruins. The magnificence of the remaining wall, and the many pieces of well-cut ſtone and fine marble ſcattered over the contiguous fields, afford ſufficient proof that both good taſte and grandeur once flouriſhed in that country. In the midſt of the rubbiſh which covers the remains of Aſſeria, the pariſh-church of the little village ſtands inſolated; it is built of broken pieces of ancient ruins, taken as they happened to be neareſt, mixed with mutilated inſcriptions, and fragments of noble cornices.

ASSERIANS, the ancient inhabitants of Aſſeria. Pliny, after having ſpecified the Liburnian cities that were obliged to attend the congreſs of Scardonia, adds to the catalogue the free Aſſerians, *immuneſque aſſeriates;* and this people, who created their own magiſtrates, and were governed by their own municipal laws, were no doubt more rich and powerful than their neighbours.

ASSERIDA, in botany, a name given by the people of Guinea to a kind of ſhrub, the leaves of which being chewed, are a cure for the colic to which that people are very ſubject.

* *To* ASSERT. *v. a.* [*aſſero*, Lat.] 1. To maintain; to defend either by words or actions.—Your forefathers have *aſſerted* the party which they choſe till death, and died for its defence. *Dryden.* 2. To affirm; to declare poſitive. 3. To claim; to vindicate a title to.—

Nor can the groveling mind,
In the dark dungeon of the limbs confin'd,
Aſſert the native ſkies, or own its heav'nly kind.
Dryden.

(1.) * ASSERTION. *n. ſ.* [from *aſſert.*] The act of aſſerting.—If any affirm the earth doth move, and will not believe with us it ſtandeth ſtill; becauſe he hath probable reaſons for it, and I no infallible ſenſe or reaſon againſt it, I will not quarrel with his *aſſertion. Brown's Vulgar Errours.*

(2.) ASSERTION is rather more accurately defined, a fact or propoſition advanced by the aſſertor, who avows the truth of it.

* ASSERTIVE. *adj.* [fom *aſſert.*] Poſitive; dogmatical; peremptory.—He was not ſo fond of the principles he undertook to illuſtrate, as to boaſt their certainty; propoſing them not in a confident and *aſſertive* form, but as probabilities and hypotheſes. *Glanville.*

* ASSERTOR. *n. ſ.* [from *aſſert.*] Maintainer; vindicator; ſupporter; affirmer.—It is an uſual piece of art to undermine the authority of fundamental truths, by pretending to ſhew how weak the proofs are, which their *aſſertors* employ in defence of them. *Atterbury.*

ASSERTORY, affirmative; poſitive. *Bailey.*

* *To* ASSERVE. *v. a.* [*aſſervio*, Lat.] To ſerve, help, or ſecond. *Dict.*

ASSES, ORDER OF, ASINORUM ORDO, a name given to the Mathuriuns, or Trinitarians, becauſe they were anciently obliged in travelling, to ride, on aſſes, inſtead of horſes. This obligation was ſet aſide by Pope Clement IV. in 1267.

ASSESIA. See ASISIA and ASSERIA

* *To* ASSESS. *v. a.* [from *aſſeſtare*, Ital. To make an equilibrium, or balance.] To charge with any certain ſum.—Before the receipt of them in this office, they were *aſſeſſed* by the affidavit from the time of the inquiſition found. *Bacon.*

* ASSESION.

* ASSESSION. *n. ſ.* [*aſſeſſio*, Lat.] A ſitting down by one, to give aſſiſtance or advice. *Dict.*

* ASSESSMENT. *n. ſ.* [from *To aſſeſs.*] 1. The ſum levied on certain property. 2. The act of aſſeſſing.—What greater immunity and happineſs can there be to a people, than to be liable to no laws, but what they make themſelves? To be ſubject to no contribution, *aſſeſſment*, or any pecuniary levy whatſoever, but what they vote, and voluntarily yield unto themſelves? *Howel.*

* ASSESSOR. *n. ſ.* [*aſſeſſor*, Lat.] 1. The perſon that ſits by another; generally uſed of thoſe who aſſiſt the judge.—

Minos, the ſtrict inquiſitor, appears;
And lives and crimes, with his *aſſeſſors*, hears.
Round in his urn the blended balls he rowls,
Abſolves the juſt, and dooms the guilty ſouls.
Dryden.

2. He that ſits by another as next in dignity.—

To his Son,
Th' *aſſeſſor* of his throne, he thus began. *Milt.*

3. He that lays taxes; derived from *aſſeſs.*

(1.) * ASSETS. *n. ſ. without the ſingular.* [*aſſez*, Fr.] Goods ſufficient to diſcharge that burden, which is caſt upon the executor or heir, in ſatisfying the teſtators or anceſtors debts or legacies.—Whoever pleads *aſſets*, ſaying nothing; but that the perſon againſt whom he pleads, hath enough come to his hands, to diſcharge what is in demand. *Cowel.*

(2.) ASSETS, in law, are either real or perſonal. Where a man hath lands in fee ſimple, and dies ſeiſed thereof, the lands which come to his heir are aſſets real; and where he dies poſſeſſed of any perſonal eſtate, the goods which come to the executors are aſſets perſonal. Aſſets are alſo divided into *aſſets per deſcent*, and *aſſets inter maines.*

1. ASSETS BY DESCENT are where a perſon is bound in an obligation, and dies ſeiſed of lands which deſcend to the heir, the land ſhall be aſſets, and the heir ſhall be charged as far as the land to him deſcended will extend.

2. ASSETS INTER MAINES are when a man indebted makes executors, and leaves them ſufficient to pay his debts and legacies; or where ſome commodity or profit ariſeth to them in right of the teſtator, which are called *aſſets in their hands.*

* *To* ASSEVER. } *v. a.* [*aſſevero*, Lat.]
* *To* ASSEVERATE. } To affirm with great ſolemnity, as upon oath.

* ASSEVERATION. *n. ſ.* [from *aſſeverate.*] Solemn affirmation upon oath.—That which you are perſuaded of, ye have it no otherwiſe than by your own only probable collection; and therefore ſuch bold *aſſeverations*, as in him was admirable, ſhould, in your mouths, but argue raſhneſs. *Hooker.*

ASSEWIARE, in old law, to draw water from marſhy grounds.

* ASSHEAD. *n. ſ.* [from *aſs* and *head.*] One low of apprehenſion; a blockhead.—Will you help an *aſshead*, and a coxcomb, and a knave, a thin faced knave, a gull? *Shakeſp. Hamlet.*

ASSHETON, William, D.D. rector of Beckenham, in Kent, was born in 1641, and educated at Brazen-noſe college, Oxford. After entering into orders, he became chaplain to the Duke of Ormond, and was admitted D.D. in 1673. Soon after, he was nominated to a prebend in the church of York, the living of St Antholin, London, and to the rectory of Beckenham in Kent. He was the firſt projector of the ſcheme for providing for clergymen's widows, and others, by a jointure payable out of the mercer's company. He wrote ſeveral pieces againſt the Papiſts and Diſſenters, and ſome devotional tracts. He died at Beckenham, in 1711, aged 70.

ASSHILL, a rivulet in Ayrſhire, in the pariſh of Colmonel, which runs into the Stinchiar.

ASSI, the modern name of the ORONTES.

ASSIDEANS, or CHASIDÆANS, [from the Heb. חסידים, *chaſidim*, merciful, pious,] thoſe Jews who reſorted to Mattathias to fight for the law of God and the liberties of their country. They were men of great valour and zeal, having voluntarily devoted themſelves to a more ſtrict obſervation of the law than other men. For after the return of the Jews from the Babyloniſh captivity, there were two ſorts of men in their church; thoſe who contented themſelves with that obedience only which was preſcribed by the law of Moſes, and who were called *Zadikim*, i. e. the *righteous*; and thoſe who, over and above the law, ſuperadded the conſtitutions and traditions of the elders, and other rigorous obſervances: theſe latter were called *Chaſidim*, i. e. the *pious.* From the former ſprung the Samaritans, Sadducees, and Caraites; from the latter, the Phariſees and the Eſſenes.

ASSIDENT SIGNS, in medicine, are ſymptoms which uſually attend a diſeaſe but not always; hence differing from *pathognomic* ſigns, which are inſeparable from the diſeaſe: *e.gr.* In the pleuriſy, a pungent pain in the ſide; in an acute fever, difficulty of breathing, &c. collectively taken, are pathognomic ſigns; but that the pain extends to the hypochondrium or clavicle, or that the patient lies with more eaſe on one ſide than on the other, are *aſſident* ſigns.

ASSIDUI, in Roman antiquity, volunteers who ſerved in the army at their own expence.

* ASSIDUITY. *n. ſ.* [*aſſiduité*, Fr. *aſſiduitas*, Lat.] Diligence; cloſeneſs of application.—I have, with much pains and *aſſiduity*, qualified myſelf for a nomenclator. *Addiſon.*

* ASSIDUOUS. *adj.* [*aſſiduus*, Lat.] Conſtant in application.—

Each ſtill renews her little labour,
Nor juſtles her *aſſiduous* neighbour. *Prior.*

* ASSIDUOUSLY. *adv.* [from *aſſiduous.*] Diligently; continually.—The trade, that obliges artificers to be *aſſiduouſly* converſant with their materials, is that of glaſs-men. *Boyle.*

ASSIDUUS, or ADSIDUUS, [from *as*, money,] among the Romans, denoted a rich or wealthy perſon. Hence we meet with *aſſiduous* ſureties, *aſſidui fidejuſſores.* When Servius Tullius divided the Roman people into five claſſes, according as they were aſſeſſed, the richer ſort who contributed aſſes were denominated *aſſidui*; and as theſe were the chief people of buſineſs who attended all the public concerns, thoſe who were diligent in attendances came to be denominated *aſſidui.*

* *To* ASSIEGE. *v. a.* [*aſſieger*, Fr.] To beſiege. Obſolete. *Dict.*—

On th' other ſide the *aſſieged* caſtles ward
Their ſtedfaſt arms did mightily maintain.
Spenſer.

(1.) AS-

(1.) * ASSIENTO. *n. ſ.* [In Spaniſh, a contract or bargain.] A contract or convention between the king of Spain and other powers, for furniſhing the Spaniſh dominions in America with negro ſlaves.

(2.) ASSIENTO. The firſt contract of this kind was made by the French Guinea Company; and, by the treaty of Utrecht, transferred to the Engliſh, who were to furniſh 4800 negroes annually.

ASSIGN, in common law, a perſon to whom a thing is aſſigned or made over. The word aſſign is ſaid to have been introduced in favour of natural children; who, becauſe they cannot paſs by the name of heirs, are compared under that of aſſigns.

* *To* ASSIGN. *v. a.* [*aſſigner*, Fr. *aſſigno*, Lat.] 1. To make out; to appoint.—True quality is neglected, virtue is oppreſſed, and vice triumphant. The laſt day will *aſſign* to every one a ſtation ſuitable to his character. *Addiſon.* 2. To fix with regard to quantity or value.—There is no ſuch intrinſick, natural, ſettled value in any thing, as to make any *aſſigned* quantity of it conſtantly worth any *aſſigned* quantity of another. *Locke.* 3. [In law] in general, to appoint a deputy, or make over a right to another; in particular, to point or ſet forth, as to *aſſign* error, is to ſhew in what part of the proceſs error is committed; to *aſſign* falſe judgment, is to declare how and where the judgment is unjuſt; to *aſſign* the ceſſor, is to ſhew how the plaintiff had ceſſed or given over; to *aſſign* waſte, is to ſhew wherein eſpecially the waſte is committed. *Cowel.*

* ASSIGNABLE. *adj.* [from *aſſign.*] That which may be marked out, or fixed.—Ariſtotle held that it ſtreamed by connatural reſult and emanation from God; ſo that there was no inſtance *aſſignable* of God's eternal exiſtence, in which the world did not alſo co-exiſt. *South.*

ASSIGNABLE MAGNITUDE, in geometry, any finite magnitude.

ASSIGNABLE RATIO, the ratio of any finite quantities.

* ASSIGNATION. *n. ſ.* [*aſſignation*, French.] 1. An appointment to meet; uſed generally of love appointments.—The lovers expected the return of this ſtated hour with as much impatience as if it had been a real *aſſignation*. *Spectator.* 2. A making over a thing to another.

ASSIGNATS, a ſpecies of paper currency, iſſued by the government of France, for ſums of different values, to the amount of many thouſand millions of livres, to ſupport the credit of the republic during the courſe of the revolution.

* ASSIGNEE. *n. ſ.* [*aſſigné*, Fr.] He that is appointed or deputed by another to do any act, or perform any buſineſs, or enjoy any commodity. And an *aſſignee* may be either in deed or in law; *aſſignee* in deed, is he that is appointed by a perſon; *aſſignee* in law, is he whom the law maketh ſo, without any appointment of the perſon. *Cowel.*

* ASSIGNER. *n. ſ.* [from *aſſign.*] He that appoints.—The goſpel is at once the *aſſigner* of our talks, and the magazine of our ſtrength. *Decay of Piety*,

(1.) * ASSIGNMENT. *n. ſ.* [from *aſſign.*] Approbation of one thing to another thing or perſon.—The only thing which maketh any place publick, is the publick *aſſignment* thereof unto ſuch duties. *Hooker.*

(2.) ASSIGNMENT, may be more accurately defined the act of transferring the intereſt or property a man has in any thing; or of appointing or ſetting over a right to another.

(3.) ASSIGNMENT OF A DOWERY, is the ſetting out of a woman's portion by the heir.

ASSILY, a river in E. Florida.

* ASSIMILABLE. *adj.* [from *aſſimilate.*] That which can be converted to the ſame nature with ſomething elſe.—The ſpirits of many will find but naked habitations; meeting no *aſſimilables* wherein to re-act their natures. *Brown's Vulgar Errours.*

(1.) * *To* ASSIMILATE. *v. a.* 1. To bring to a likeneſs, or reſemblance.—A ferine and neceſſitous kind of life would eaſily *aſſimilate* at leaſt the next generation to barbariſm and ferineneſs. *Hale.* 2. To turn to its own nature by digeſtion.—

Taſting concoct, digeſt, *aſſimilate*,
And corporeal to incorporeal turn. *Milton.*

(2.) * *To* ASSIMILATE. *v. n.* [*aſſimilo*, Lat.] To perform the act of converting food to nouriſhment.—Birds *aſſimilate* leſs, and excern more, than beaſts; for their excrements are ever liquid, and their fleſh generally more dry. *Bacon.*

* ASSIMILATENESS. *n. ſ.* [from *aſſimilate.*] Likeneſs. *Dict.*

(1.) * ASSIMILATION. *n. ſ.* [from *aſſimilate.*] 1. The act of converting any thing to the nature or ſubſtance of another.—It furthers the very act of *aſſimilation* of nouriſhment, by ſome outward emollients that make the parts more apt to aſſimilate. *Bacon.* 2. The ſtate of being aſſimilated, or becoming like ſomething elſe.—A nouriſhment is a large acceptation, but not in propriety conſerving the body, not repairing it by *aſſimilation*, but preſerving it by ventilation. *Brown.*

(2.) ASSIMILATION, in phyſics, is that motion by which bodies convert other bodies related to them, or at leaſt ſuch as are prepared to be converted, into their own ſubſtance and nature. Thus, flame multiplies itſelf upon oily bodies, and generates new flame; air upon water, and produces new air; and all the parts, as well ſimilar as organical, in vegetables and animals, firſt attract with ſome election or choice, nearly the ſame common or not very different juices for aliment, and afterwards aſſimilate or convert them to their own nature.

* *To* ASSIMULATE. *v. a.* [*aſſimulo*, Lat.] To feign; to counterfeit. *Dict.*

* ASSIMULATION. *n. ſ.* [*aſſimulatio*, Lat.] A diſſembling; a counterfeiting. *Dict.*

ASSINGTON, two villages, viz. 1. in Suffolk, 3 miles NW. of Nayland: 2. in Suffolk, 3 miles NW. of Steyning.

(1.) ASSINT, or ASSYNT, [from *agus inſ*, Gael. *i.e.* in and out, alluding to the ſurface of the country,] a pariſh of Scotland in the county of Sutherland, on the WNW. coaſt. An arm of the ſea, called *Kilis*, waſhes it on the N. Mr M'Kenzie, the miniſter, who, in his Statiſtical report to ſir John Sinclair, gives a particular geographical deſcription of it, eſtimates the extent of the pariſh at about 15 miles in breadth, 25 in length, and (calculating all its windings,) about 100 in circumference. There are 7 iſlands belonging to it, viz. Elanagharin, Elanandu, Maukel-anan, Oldnev, Crona),

ıay, Soay, and Klett. The lofty mountains, h-covered hills, ſtupenduous precipices, nu- ous lakes, winding rivers, awful cataracts, and tiful valleys, render the ſcene truly romantic. climate is healthy, though rainy, as a proof of h ſeveral of the natives have lived to 100 years upwards. The preſent population is about . The pariſh has no ſhipping, although it has al excellent harbours. It has about 9000 black e, and abounds in lime-ſtone, iron, marble, The people marry young, notwithſtanding h, the women bear children long;—ſome e- above the age of 50! Good roads and inns ld greatly improve the pariſh, and fiſheries it be carried on in it with great advantage, to as have money and ſpirit to engage in them.

.) ASSINT, the name of a lofty mountain in bove pariſh. See N° 1.

SSIR. See next article.

SSIRATUM, in antiquity, a bloody draught, rewith treaties were ratified. It was made of and blood, called by the ancient Romans R.

SSIS, in phyſiology, denotes opium, or a pow- nade of hemp-ſeed, which being formed into ſes about the bigneſs of cheſnuts, is ſwallowed he Egyptians, who are hereby intoxicated and me ecſtatic, and full of the moſt agreeable vi- . It is alſo called by the Turks ASSERAC.

SSISA, in old law Latin, an ASSIZE. Hence ollowing terms ſtill uſed in the Engliſh law:

ASSISA CADERE, to fall from the aſſize, in is to be non-ſuited.

ASSISA CADIT IN JURATUM, is where the in controverſy is ſo doubtful, that it muſt ſſarily be tried by a jury.

ASSISA CAPI IN MODUM ASSISE, is when defendant pleads directly to the aſſize, with- taking any exception to the court, declara- , or writ.

ASSISA CONTINUANDA, a writ directed to juſtices, to take an aſſize for the continuance he cauſe, where certain records alledged can- in time be procured by the party.

ASSISÆ JUDICIUM, ſignifies a judgment of court, given either againſt the plaintiff or de- lant, for default.

ASSISA NOCUMENTI, an aſſize of nuiſance.

ASSISA PANIS & CEREVISIÆ, denotes the er or privilege of aſſigning, and adjuſting the ght and meaſure of bread and beer.

ASSISA PROROGANDA, is a writ directed to juſtices of aſſize, for the ſtay of proceedings, account of the king's buſineſs, wherein the y is employed.

SSISE, or ASSIZE. See ASSIZE.

SSISER. See ASSIZER.

SSISIA, a penſion.

SSISII, in eccleſiaſtical writers, perſons be- ced in a cathedral church, not in a rank be- that of canons; thus called, either becauſe were allowed an *aſſiſia* or penſion, or from *ſus*, diligent.

SSISIO, an epiſcopal town of Italy, in the hy of Spoleto, which has a very magnificent edral of St Francis, compoſed of 3 churches, above another. See ASISIO.

ASSISOR, the ſame with ASSESSOR or ASSIZER.

* *To* ASSIST. *v. a.* [*aſſiſter*, Fr. *aſſiſto*, Lat.] To help.—Receive her in the Lord, as becometh ſaints, and *aſſiſt* her in whatſoever buſineſs ſhe hath need. *Rom.* xvi. 2.

* ASSISTANCE. *n. ſ.* [*aſſiſtance*, Fr.] Help; furtherance.—The council of Trent commends recourſe, not only to the prayers of the ſaints, but to their aid and *aſſiſtance*: What doth this aid and *aſſiſtance* ſignify? *Stillingfleet.*

(1.) * ASSISTANT. *adj.* [from *aſſiſt*] Helping; lending aid.—Some perchance did adhere to the duke, and were *aſſiſtant* to him openly, or at leaſt under hand. *Hale.*

(2.) * ASSISTANT. *n. ſ.* [from *aſſiſt.*] 1. A perſon engaged in an affair not as principal, but as auxiliary or miniſterial.—Some young towardly noblemen or gentlemen were uſually ſent as *aſſiſtants* or attendants, according to the quality of the perſons. *Bacon.* 2. Sometimes it is perhaps only a ſofter word for an attendant.—

The pale *aſſiſtants* on each other ſtar'd
With gaping mouths for iſſuing words prepar'd,
Dryden.

(3.) ASSISTANTS, in trading or public companies, members who uſually have the *whole* power of managing the company's affairs; and commonly called the court of aſſiſtants.

ASSISUS, in ancient law writers, a thing farmed out for a certain rent, in money or proviſions.

ASSITHMENT, [from *ad*, to, Lat. and *ſithe*, Sax. inſtead of,] a wiregold, or compenſation by a pecuniary mulct *quod vice ſupplicii ad expiandum delictum ſolvitur.*

ASSIUS LAPIS, in phyſiology. See LAPIS ASSIUS.

(1.) * ASSIZE. *n. ſ.* [*aſſiſe*, a ſitting, Fr.] 1. An aſſembly of knights and other ſubſtantial men, with the bailiff or juſtice, in a certain place, and at a certain time. 2. A jury. 3. An ordinance or ſtatute. 4. The court, place, or time, where and when the writs and proceſſes of *aſſize* are taken. *Cowel.*—The law was never executed by any juſtices of *aſſize*, but the people left to their own laws. *Davies.* 5. Any court of juſtice.—

The judging God ſhall cloſe the book of fate,
And there the laſt *aſſizes* keep,
For thoſe who wake, and thoſe who ſleep.
Dryden.

6. *Aſſize of bread, ale*, &c. Meaſure of price or rate. Thus it is ſaid, *when wheat is of ſuch a price, the bread ſhall be of ſuch* aſſize. 7. Meaſure for which we now uſe *ſize.*—

On high hill's top I ſaw a ſtately frame,
An hundred cubits high by juſt *aſſize*,
With hundred pillars. *Spenſer.*

(2.) ASSIZE, in old Engliſh law books, is defined to be an aſſembly of knights, and other ſubſtantial men, together with a juſtice, in a certain place, and at a certain time: but the word, in its preſent acceptation, implies a court, place, or time, when and where the writs and proceſſes, whether civil or criminal, are decided by judge and jury. All the counties of England are divided into 6 circuits; and 2 judges are aſſigned by the king's commiſſion, who hold their aſſizes twice a-year in every county (except London and Middleſex,

Middlesex, where courts of *nisi prius* are holden in and after every term, before the chief or other judge of the several superior courts; and except the 4 northern counties, where the assizes are taken only once a-year) to try by a jury of the respective counties the truth of such matters of fact as are then under dispute in the courts of Westminster hall. These judges of assize came into use in the room of the ancient justices in eyre, *justiciarii in itinere*; who were regularly established, if not first appointed, by the parliament of Northampton, A. D. 1176, 22 Hen. II. with a delegated power from the king's great court or *aula regia*, being looked upon as members thereof: and they afterwards made their circuit round the kingdom once in 7 years for the purpose of trying causes. They were afterwards directed by *magna charta*, c. 12. to be sent into every county once a-year to take or try certain actions then called *recognitions* or *assizes*; the most difficult of which they are directed to adjourn into the court of common pleas to be there determined. The itinerant justices were sometimes mere justices of assize, or of dower, or of goal-delivery, and the like; and they had sometimes a more general commission, to determine all manner of causes, *justiciarii ad omnia placita*: but the present justices of assize and *nisi prius* are more immediately derived from the statute Westm. 2. 13 Edw. I. c. 30. explained by several other acts, particularly the statute 14 Edw. III. c. 16. and must be two of the king's justices of the one bench or the other, or the chief baron of the exchequer, or the king's serjeant's sworn. They usually make their circuits in the respective vacations after Hilary and Trinity terms; assizes being allowed to be taken in the holy time of Lent by consent of the bishops at the king's request, as expressed in statute Westm. 1. 3 Edw. I. c. 51. And it was also usual, during the times of popery, for the prelates to grant annual licences to the justices of assize to administer oaths in holy times: for oaths being of a sacred nature, the logic of those deluded ages concluded that they must be of ecclesiastical cognizance. The prudent jealousy of our ancestors ordained that no man of law should be judge of assize in his own country: and a similar prohibition is found in the civil law, which has carried this principle so far, that it is equivalent to the crime of sacrilege, for a man to be governor of the province in which he was born, or has any civil connection. The judges upon their circuits now sit by virtue of 5 several authorities. 1. The commission of the *peace*, in every county of the circuits; and all justices of the peace of the county are bound to be present at the assizes; and sheriffs are also to give their attendance on the judges, or they shall be fined. 2. A commission of *oyer* and *terminer*, directed to them and many other gentlemen of the county, by which they are empowered to try treasons, felonies, &c. and this is the largest commission they have. 3. A commission of general *goal-delivery*, directed to the judges and the clerk of assize associate, which gives them power to try every prisoner in the goal committed for any offence whatsoever, but none but prisoners in the goal: so that one way or other they rid the goal of all the prisoners in it. 4. A commission of *assize*, directed to the judges and clerk of assize, to take assizes; that is to take the verdict of a peculiar species of jury called an *assize*, and summoned for the trial of *landed* disputes. The other authority is, 5. That of *nisi prius*, which is a consequence of the commission of *assize*, being annexed to the office of those justices by the statute of Westm. 2. 13 Edw. I. c. 30. And it empowers them to try all questions of fact issuing out of the courts of Westminster, that are then ripe for trial by jury. The original of the name is this: all causes commenced in the courts at Westminster hall are by the course of the court appointed to be there tried, on a day fixed in some Easter or Michaelmas term, by a jury returned from the county wherein the cause of action arises; but with this proviso, *nisi prius justiciarii ad assisas capiendas venerint*; unless before the day prefixed the judges of assize come into the county in question. This they are sure to do in the vacations preceding each Easter and Michaelmas term, and there dispose of the cause; which saves much expence to all concerned.

(3.) ASSIZE, or jury, in Scots law, consists of 15 sworn men, *(juratores,)* picked out by the court from a greater number, not exceeding 45, who have been summoned for that purpose by the sheriff, and given in list to the defender, at serving him with a copy of his libel.

* *To* ASSIZE. *v. a.* [from the noun.] To fix the rate of any thing by an *assize* or writ.

* ASSIZER, or ASSISER. *n. f.* [from *assize*.] An officer that has the care and oversight of weights and measures. *Chambers.*

ASSIZES, GENERAL, in the English law, is when the judges go to their circuits.

* ASSOCIABLE. *adj.* [*associabilis*, Lat.] That which may be joined together.

(1.) * ASSOCIATE. *adj.* [from the verb.] Confederate; joined in interest or purpose.—

While I descend through darkness,
To my *associate* pow'rs, them to acquaint
With these successes. *Milton.*

(2.) * ASSOCIATE. *n. f.* [from the verb.] 1. A person joined with another; a partner.—They persuade the king, now in old age, to make Pixgus his *associate* in government with him. *Sidney.* 2. A confederate, in a good or neutral sense; an accomplice in ill.—Their defender, and his *associates*, have hitherto proposed to the world a form such as themselves like. *Hooker.* 3. A companion, implying some kind of equality.—He was accompanied with a noble gentleman, no unsuitable *associate*. *Wotton.*

(3.) ASSOCIATE PRESBYTERY, the title first assumed by those clergymen, who associated together, after seceding from the church of Scotland in 1733.

(4.) ASSOCIATE SYNOD, the highest ecclesiastical court among the Antiburgher Seceders, where its decisions are final, like those of the General Assembly in the Established Church. See ANTIBURGHER and SECEDERS.

(1.) * *To* ASSOCIATE. *v. a.* [*associer*, Fr. *associo*, Lat.] 1. To unite with one another as a confederate.—

A fast-

A fearful army led by Caius Marcius,
ſociated with Aufidius, rages
pon our territories. *Shakeſpeare.*
'o adopt as a friend upon equal terms.—
Aſſociate in your town a wand'ring train,
id ſtrangers in your palace entertain. *Dryden.*
'o accompany; to keep company with ano-
—
Friends ſhould *aſſociate* friends in grief and
woe. *Shakeſpeare.*
'o unite; to join.—Some oleaginous particles
rceivedly *aſſociated* themſelves to it. *Boyle.* 5.
s generally the particle *with*; as, he *aſſociat-ith* his maſter's enemies.
.) * *To* ASSOCIATE. *v. n.* To unite himſelf;
in himſelf.
.) * ASSOCIATION. *n. ſ.* [from *aſſociate.*]
nion; conjunction; ſociety.—The church be-ſociety, hath the ſelf ſame original grounds,
h other politic ſocieties have; the natural
nation which all men have unto ſociable life,
conſent to ſome certain bond of *aſſociation*;
h bond is the law that appointeth what kind
rder they ſhall be *aſſociated* in. *Hooker.* 2.
ſederacy; union for particular purpoſes, good
l.—This could not be done but with mighty
oſition: againſt which, to ſtrengthen them-s, they ſecretly entered into a league of *aſſo-on. Hooker.* 3. Partnerſhip.—Self-denial is a
l of holy *aſſociation* with God; and, by ma-you his partner, intereſts you in all his hap-s. *Boyle.* 4. Connection.—*Aſſociation* of ideas
of great importance, and may be of excel-uſe. *Watts.* 5. Appoſition; union of mat-—The changes of corporeal things are to be
ed only in the various ſeparations, and new *iations* and motions of theſe permanent par-s. *Newton.*
.) ASSOCIATION, in law, is a patent by the
, either of his own motion, or at the ſuit of
rty plaintiff, to the juſtices of aſſize; to have
r perſons *aſſociated* with them, in order to take
aſſize.
.) ASSOCIATION OF IDEAS, is where two or
e ideas conſtantly and immediately accom-y or ſucceed one another in the mind, ſo that
hall almoſt infallibly produce the other, whe-there be any natural relation between them
ot. See METAPHYSICS. Where there is a
affinity or connection in ideas, it is the excel-y of the mind, to be able to collect, compare,
range them in order, in its inquiries: but
re there is none, nor any cauſe to be aſſigned
their accompanying each other, but what is
ng to mere accident or habit; this unnatural
ciation becomes a great imperfection, and is,
erally ſpeaking, a main cauſe of error, or wrong
uctions in reaſoning. Thus the idea of gob-and ſprights has really no more affinity with
kneſs than with light; and yet let a fooliſh
d inculcate theſe ideas often on the mind of a
d, and raiſe them there together, it is poſſible
hall never be able to ſeparate them again ſo
as he lives, but darkneſs ſhall ever bring with
hoſe frightful ideas. With regard to this in-ce, however, it muſt at the ſame time be ob-ed, that the connection alluded to appears
from being either unnatural or abſurd. See
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APPARITION. Such wrong combinations of ideas, Mr Locke ſhows, are a great cauſe of the irreconcileable oppoſition between the different ſects of philoſophy and religion: for we cannot imagine, that all who hold tenets different from, and ſometimes even contradictory to, one another, ſhould wilfully and knowingly impoſe upon themſelves, and refuſe truth offered by plain reaſon: but ſome looſe and independent ideas are by education, cuſtom, and the conſtant din of their party, ſo coupled in their minds, that they always appear there together: theſe can no more ſeparate in their thoughts, than if they were but one idea, and they operate as if they were ſo. This gives the appearance of ſenſe to jargon, of demonſtration to abſurdities, and of conſiſtency to non-ſenſe. It is the foundation of the greateſt, and almoſt of all the errors in the world. Aſſociation forms a principal part of Dr Hartley's mechanical theory of the mind. He diſtinguiſhes it into ſynchronous and ſucceſſive; and aſcribes our ſimple and complex ideas to the influence of this principle or habit. Particular ſenſations reſult from previous vibrations conveyed through the nerves to the medullary ſubſtance of the brain; and theſe are ſo intimately aſſociated together, that any one of them, when impreſſed alone, ſhall be able to excite in the mind the ideas of all the reſt. Thus we derive the ideas of natural bodies from the aſſociation of the ſeveral ſenſible qualities with the names that expreſs them, and with each other. The ſight of part of a large building ſuggeſts the idea of the reſt inſtantaneouſly, by a ſynchronous aſſociation of the parts; and the ſound of the words, which begin a ſimilar ſentence, brings to remembrance the remaining parts, in order, by ſucceſſive aſſociation. Dr Hartley maintains, that ſimple ideas run into complex ones by aſſociation; and apprehends, that by purſuing and perfecting this doctrine, we may ſome time or other be enabled to analyſe thoſe complex ideas, that are commonly called the *ideas of reflection*, or *intellectual ideas*, into their ſeveral component parts, i. e. into the ſimple ideas of ſenſation of which they conſiſt; and that this doctrine may be of conſiderable uſe in the art of logic, and in explaining the various phenomena of the human mind.

(4.) ASSOCIATION OF PARLIAMENT. In the reign of king William III. the parliament entered into a ſolemn aſſociation to defend his majeſty's perſon and government againſt all plots and conſpiracies; and all perſons bearing offices, civil or military, were enjoined to ſubſcribe the aſſociation to ſtand by king William, on pain of forfeitures and penalties, &c. by ſtat. 7 and 8 W. III. c. 27.

ASSODES, in medicine, a continued fever wherein the ſurface is moderately warm, but the internal heat great.

To ASSOILE, in our ancient law books, ſignifies to abſolve from an excommunication.

To ASSOILZIE, *v. a*, in Scots law, to abſolve or free.

(1.) * ASSONANCE. *n. ſ.* [*aſſonance*, Fr.] Reference of one ſound to another reſembling it. Reſemblance of ſound. *Did.*

Caius has an action on the caſe a-
..r for this breach of his expreſs
taking, or aſſumpſit; and ſhall re-
ury ſatisfaction for the injury ſuſ-
i delay. So alſo in the caſe of a
· contract, if the debtor promiſes
loes not, this breach of promiſe in-
tor to his action on the caſe, inſtead
n to an action of debt. Thus like-
'ory note, or note of hand not un-
›ay money at a day certain, is an
'pſit; and the payee at common
·ıſtom and act of parliament the in-
ecover the value of the note in da-
remains unpaid. Some agreements
igh never ſo expreſsly made, are
› important a nature, that they ought
·· verbal promiſe only, which cannot
·it by the memory (which ſometimes
the perjury) of witneſſes. To pre-
the ſtatute of frauds and perjuries,
. 3. enacts, that in the five following
verbal promiſe ſhall be ſufficient to
ıction upon, but at the leaſt ſome note
.·dum of it ſhall be made in writing,
›y the party to be charged therewith:
.n executor or adminiſtrator promiſes
damages out of his own eſtate. 2.
ıan undertakes to anſwer for the debt,
, miſcarriage, of another. 3. Where
ment is made upon conſideration of
4. Where any contract or ſale is made
.enements, or hereditaments, or any in-
·in. 5. And laſtly, where there is any
that is not to be performed within a
. the making thereof. In all theſe caſes,
:bal aſſumpſit is void.

ASSUMPSIT, IMPLIED, CASES OF. From expreſs contracts, the tranſition is eaſy
hat are only implied by law: Which are
juſtice and reaſon dictate, and which
the law preſumes that every man has
d to perform; and, upon this preſump-
.kes him anſwerable to ſuch perſons as
; his non-performance. Thus, I. If I
ı perſon to tranſact any buſineſs for me,
:m any work, the law implies, that I un-
, or aſſumed, to pay him ſo much as his
leſerved: and if I neglect to make him a-
he has a remedy for this injury, by bring-
ıction on the caſe, upon this implied af-
; wherein he is at liberty to ſuggeſt that I
·d to pay him ſo much as he reaſonably
d, and then to aver, that his trouble was
worth ſuch a particular ſum, which the de-
t has omitted to pay. But this valuation
trouble is ſubmitted to the determination
ıry; who will aſſeſs ſuch a ſum in damages
y think he really merited. This is called
aſſumpſit on a *quantum meruit*. II. There is an
ıd aſſumpſit on a *quantum valebat*, which is
ſimilar to the former; being only where one
up goods or wares of a tradeſman, without
any agreeing for the price. There the law
ımes, that both parties did intentionally a-
that the real value of the goods ſhould be
, and an action on the caſe may be brought
ıingly, if the vendee refuſes to pay that va-
lue. III. A third ſpecies of implied aſſumpſit is, when one has had and received money, belonging to another, without any valuable conſideration, given on the receiver's part: for the law conſtrues this to be money had and received, for the uſe of the owner only; and implies, that the perſon ſo receiving, promiſed and undertook to account for it to the true proprietor. And, if he unjuſtly detains it, an action on the caſe lies againſt him for the breach of ſuch implied promiſe and undertaking; and he will be made to repair the owner in damages, equivalent to what he has detained in ſuch violation of his promiſe. This is a very extenſive and beneficial remedy, applicable to almoſt every caſe where the defendant has received money which *ex æquo et bono* he ought to refund. It lies for money paid by miſtake, or on a conſideration which happens to fail, or through impoſition, extortion, or oppreſſion, or where undue advantage is taken of the plaintiff's ſituation. IV. Where a perſon has laid out and expended his money for the uſe of another, at his requeſt, the law implies a promiſe of repayment, and an action will lie on this aſſumpſit. V. Upon a ſtated account between two merchants, or other perſons, the law implies that he againſt whom the balance appears, has engaged to pay it to the other; though there be not any actual promiſe. And from this implication, it is frequent for actions on the caſe to be brought, declaring that the plaintiff and defendant had ſettled their accounts together, *inſimul computaſſent*, (which gives name to this ſpecies of aſſumpſit); and that the defendant engaged to pay the plaintiff the balance, but has ſince neglected to do it. But if no account has been made up, the legal remedy is by bringing a writ of *account de computo*; commanding the defendant to render a juſt account to the plaintiff, or ſhew the court good cauſe to the contrary. In this action, if the plaintiff ſucceeds, there are two judgments; the firſt is, that the defendant do account *(quod computet)* before auditors appointed by the court; and when ſuch account is finiſhed, then the ſecond judgment is, that he do pay the plaintiff ſo much as he is found in arrear. VI. The laſt claſs of contracts, implied by reaſon and conſtruction of law, ariſes upon this ſuppoſition, that every one who undertakes any office, employment, truſt, or duty, contracts with thoſe who employ or entruſt him, to perform it with integrity, diligence, and ſkill: and if by his want of either of thoſe qualities, any injury accrues to individuals, they have therefore their remedy in damages, by a ſpecial action on the caſe. A few inſtances will fully illuſtrate this matter. If an officer of the public is guilty of neglect of duty, or a palpable breach of it, of non-feaſance or of miſ-feaſance; as, if the ſheriff does not execute a writ ſent to him, or if he wilfully makes a falſe return thereof; in both theſe caſes, the party aggrieved ſhall have an action *on the caſe*, for damages to be aſſeſſed by a jury. If a ſheriff or gaoler ſuffers a priſoner who is taken upon meſne proceſs (that is, during the pendency of a ſuit) to eſcape, he is liable to an action *on the caſe*. But if, after judgment, a gaoler or a ſheriff permits a debtor to eſcape, who is charged in execution for a certain ſum; the debt immedi-

ately becomes his own, and he is compellable by action of *debt*, being for a ſum liquidated and aſcertained, to ſatisfy the creditor in his whole demand. An advocate or attorney that betray the cauſe of their client, or, being retained, neglect to appear at the trial, by which the cauſe miſcarries, are liable to an action on the caſe, for a reparation to their injured client. There is alſo in law always an implied contract with a common inn-keeper, to ſecure his gueſt's goods in his inn; with a common carrier or barge-maſter, to be anſwerable for the goods he carries; with a common farrier, that he ſhoes a horſe well, without laming him; with a common taylor, or other workman, that he performs his buſineſs in a workman-like manner: in which, if they fail, an action on the caſe lies to recover damages for ſuch breach of their general undertaking. Alſo if an inn-keeper, or other victualler, hangs out a ſign, and opens his houſe for travellers, it is an implied engagement to entertain all perſons who travel that way; and upon this univerſal aſſumpſit, an action on the caſe will lie againſt him for damages, if he without good reaſon refuſes to admit a traveller. In contracts likewiſe for ſales, if the ſeller doth upon the ſale warrant it to be good, the law annexes a tacit contract to this warranty, that if it be not ſo, he ſhall make compenſation to the buyer: elſe it is an injury to good faith, for which an action on the caſe will lie to recover damages.

(1.) * ASSUMPTION. *n. ſ.* [*aſſumptio*, Lat.] 1. The act of taking any thing to one's ſelf.—The perſonal deſcent of God himſelf, and his *aſſumption* of our fleſh to his divinity, more familiarly to inſinuate his pleaſure to us, was an inforcement beyond all methods of wiſdom. *Hammond.* 2. The ſuppoſition or act of ſuppoſing of any thing without farther proof.—Theſe by way of *aſſumption*, under the two general propoſitions, are intrinſically and naturally good or bad. *Norris.* 3. The thing ſuppoſed; a poſtulate.—For the *aſſumption*, that Chriſt did ſuch miraculous and ſupernatural works, to confirm what he ſaid, we need only repeat the meſſage ſent by him to John the Baptiſt. *South.* 4. The taking up any perſon into heaven, which is ſuppoſed by the Romiſh church of the Bleſſed Virgin.—Upon the feaſt of the *aſſumption* of the Bleſſed Virgin, the pope and cardinals keep the veſpers. *Stillingfleet.*

(2.) ASSUMPTION, a feſtival in the Romiſh church, in honour of the miraculous aſcent of the Virgin Mary into heaven: the Greek church, who alſo obſerve this feſtival, celebrate it on the 15th of Auguſt with great ceremony. By ſuch multiplications of falſe miracles, theſe churches have thrown no ſmall degree of diſcredit on the true ones.

(3.) ASSUMPTION, an iſland of North America, in the gulph of St Laurence, at the mouth of the river. It is covered with trees. Lon. 60. 40. W. Lat. 49. 30. N.

(4.) ASSUMPTION, a large and populous town of S. America, in Paraguay, ſeated on the river. It is a biſhop's ſee, and is ſeated in a country, fertile in corn and fruits, whoſe trees are always green. There is likewiſe a quantity of paſture, and the air is temperate and ſalutary. Lon. 40. W. Lat. 34. 10. S.

(5.) ASSUMPTION, in logic, is the minor or ſecond propoſition in a categorical ſyllogiſm. It is alſo uſed for a conſequence drawn from the propoſitions whereof an argument is compoſed.

(1) * ASSUMPTIVE. *adj.* [*aſſumptivus*, Lat.] That is aſſumed.

(2.) ASSUMPTIVE ARMS, in heraldry, are ſuch a perſon has a right to aſſume, with the approbation of his ſovereign, and of the heralds: that is, a perſon, who has no right by blood, and his coat of arms, ſhall captivate, in any lawful war, any gentleman, nobleman, or prince, he is, in that caſe, intitled to bear the ſhield of that prince and enjoy it to him and his heirs for ever.

* ASSURANCE. *n. ſ.* [*aſſurance*, Fr.] 1. Certain expectation.—Though hope be, indeed, lower and leſſer thing than *aſſurance*, yet, as to the purpoſes of a pious life, it may prove to *South.* 2. Secure confidence; truſt.—

What man is he, that boaſts of fleſhly
And vain *aſſurance* of mortality.
Fairy

3. Freedom from doubt; certain knowledge. Proof from the authority of man's judgment not able to work that *aſſurance*, which doth by a ſtronger proof. *Hooker.* 4. Firmneſs; undoubting ſteadineſs.—Men whoſe confidence will relieve our modeſty, and give us courage *aſſurance* in the duties of our profeſſion. 5. Confidence; want of modeſty; exemption awe or fear.—My behaviour ill governed, gave the firſt comfort; my affection ill hid, hath you this laſt *aſſurance*. *Sidney.* 6. Freedom vicious ſhame.—Converſation when they into the world, will add to their knowledge *aſſurance*. *Locke.* 7. Ground of confidence curity given.—The nature of deſire itſelf easier to receive belief, than it is hard to belief; for as deſire is glad to embrace the ſhew of comfort, ſo is deſire deſirous of *aſſurance*. *Sidney.* 8. Spirit; intrepidity.—like reſolute men, ſtood in the face of the with more *aſſurance* than the wall itſelf. 9. Sanguineneſs; readineſs to hope.—The the grace of hope, but a good natural or confidence, which Ariſtotle obſerves to be full of, and old men not ſo in *Hammond.* 10. Teſtimony of credit.—

I am a gentleman of blood and breed
And from ſome knowledge and *aſſurance*
Offer this office. *Shakeſpeare's Lear.*

11. Conviction.—Such an *aſſurance* of the will make men careful to avoid a leſſer ought to awaken men to avoid a greater *Tillotſon.* 12. [In theology.] Security reſpect to a future ſtate; certainty of with God. 13. The ſame with *inſurance*.

INSURANCE.

* *To* ASSURE. *v. a.* [*aſſeurer*, Fr. from *rare*, low Lat.] 1. To give confidence by promiſe.—So when he had *aſſured* them words, that he would reſtore them according to the agreement, they let him the ſaving of their brethren. 2. To ſecure to another; to make firm.—So

authority cannot be reflected on without the oft awful reverence, even by those whose piety ures its favour to them. *Rogers.* 3. To make nfident; to exempt from doubt or fear; to con- ſecurity.—And hereby we know, that we are the truth, and ſhall *aſſure* our hearts before m. 1 *John* iii. 19. 4. To make ſecure: with —

But what on earth can long abide in ſtate?
Or who can him *aſſure of* happy days: *Spenſer.*

To affiance; to betroth.—This diviner laid him to me, called me Dormio, ſwore I was *aſ-ured* to her. *Shakeſ. Comedy of Errours.*

* ASSURED. *participial adj.* [from *aſſure.*] Certain; indubitable; not doubted.—It is an *ſured* experience, that flint laid about the bot-m of a tree makes it proſper. *Bacon's Nat. Hiſt.*

Certain; not doubting.—

Young princes, cloſe your hands,
——And your lips too; for, I am well *aſſured,*
That I did ſo, when I was firſt *aſſur'd. Shakeſ.*

Immodeſt; viciouſly confident.

* ASSUREDLY. *adv.* [from *aſſured.*] Certainly; dubitably.—*Aſſuredly* he will ſtop our liberty, ll we reſtore him his worſhip. *South.*

* ASSUREDNESS. *n. ſ.* [from *aſſured.*] The ate of being aſſured; certainty.

* ASSURER. *n. ſ.* [from *aſſure.*] 1. He that ives aſſurance. 2. He that gives ſecurity to make ood any loſs.

ASSURGENT LEAVES, in botany, denotes ſuch s are firſt bent down, and then riſe erect towards ie apex.

ASSUROR, a merchant, or other perſon, who akes out a policy of aſſurance, and thereby in-ures a ſhip, houſe, or the like.

ASSURRANI, or } a branch of Donatiſts in the
ASSURRITANI, } middle of the 4th century, who maintained the Son to be inferior to the Fa-ier; rebaptized their converts from the catholics, nd aſſerted that the church is not compoſed of ood and bad, but of the good alone.

ASSUS, or Assos, in ancient geography, a own of Troas, though by others ſuppoſed to be f Myſia, and the ſame with Apollonia; but dif-rent from the Apollonia on the Rhyndacus. Pto-my places it on the ſea coaſt, but Strabo more nland. It was the country of Cleanthes the ſtoic hiloſopher, who ſucceeded Zeno. St Luke and thers of St Paul's companions in his voyage (Acts x. 13, 14), went by ſea from Troas to Aſſos: ut St Paul went thither by land, and meeting hem at Aſſos, they all went together to Mitylene. t is ſtill called *Aſſos.* See Assos.

* *To* ASSWAGE. See Assuage.

ASSYLUM, a town of the United States, in uzerne county, Pennſylvania, lately laid out on he SW. ſide of the E. branch of the Suſquehan-a, 54 miles from Wilkſbarre. It contains about 5 houſes, all inhabited by Frenchmen.

ASSYNT. See Assint.

(1.) ASSYRIA, an ancient kingdom of Aſia, concerning the extent, commencement, and du-ation of which, hiſtorians differ greatly in their accounts. Several ancient writers, in particular Cteſias and Diodorus Siculus, have affirmed, that the Aſſyrian monarchy, under Ninus and Semira-mis, comprehended the greater part of the known world. Had this been the caſe, it is not likely that Homer and Herodotus would have omitted a fact ſo remarkable. The ſacred records intimate, that none of the ancient ſtates or kingdoms were of conſiderable extent; for neither Chedorlaomer, nor any of the neighbouring princes, were tributary or ſubject to Aſſyria; and we find nothing of the greatneſs or power of this kingdom in the hiſtory of the judges and ſucceeding kings of Iſrael, though the latter kingdom was oppreſſed and enſlaved by many different powers in that period. It is highly probable, therefore, that Aſſyria was originally of ſmall extent. According to Ptolomy it was bounded on the N. by Armenia Major; on the W. by the Tigris; on the S. by Suſiana; and on the E. by Media.

(2.) Assyria, history of. The origin and revolutions of the Aſſyrian monarchy were as follows.—The founder of it was Aſhur the ſecond ſon of Shem, who went out of Shinar, either by the appointment of Nimrod, or to elude the fury of that tyrant; conducted a large body of adventurers into Aſſyria, and laid the foundation of Nineveh. *Gen.* x. 11. Theſe events happened not long after Nimrod had eſtabliſhed the Chaldæan monarchy, and fixed his reſidence at Babylon. The Perſian hiſtorians ſuppoſe that the kings of Perſia of the firſt dynaſty were the ſame with the kings of Aſſyria, of whom Zohath, or Nimrod, was the founder of Babel. (*Herbelot Orient. Bibl.* v. *Bagdad*) It does not, however, appear, that Nimrod reigned in Aſſyria. The kingdoms of Babylon and Aſſyria were originally diſtinct and ſeparate; (*Micah* v. 6.) and in this ſtate they remained until Ninus conquered Babylon, and made it tributary to the Aſſyrian empire. Ninus, the ſucceſſor of Aſhur, (*Gen.* x. 11. *Diod. Sic. lib.* 1.) ſeized on Chaldæa, after the death of Nimrod, and united the kingdoms of Aſſyria and Babylon. This prince is ſaid to have ſubdued Aſia, Perſia, Media, Egypt, &c. If he did ſo, the effects of his conqueſts were of no duration; for in the days of Abraham, we do not find that any of the neighbouring kingdoms were ſubject to Aſſyria. He was ſucceeded by Semiramis, a princeſs of an heroic mind; bold, enterpriſing, fortunate; but of whom many fabulous things have been recorded. It appears, however, that there were two princeſſes of the ſame name, who flouriſhed at very different periods. One of them was the conſort of Ninus; and the other lived five generations before Nitocris queen of Nebuchadnezzar. (*Euſeb. Chron. p.* 58. *Herod. lib.* 1. *cap.* 184) This fact has not been attended to by many writers. Whether there was an uninterrupted ſeries of kings from Ninus to Sardanapalus, or not, is ſtill a queſtion. Some ſuſpicion has ariſen, that the liſt which Cteſias has given of the Aſſyrian kings is not genuine; for many names in it are of Perſian, Egyptian, and Grecian extraction. Nothing memorable has been recorded concerning the ſucceſſors of Ninus and Semiramis. Of that effeminate race of princes it is barely ſaid that they aſcended the throne, lived in indolence, and died in their palaces at Nineveh. Diodorus relates, that in the reign of Teutames, the Aſſyrians, ſolicited by Priam their vaſſal, ſent to the Trojans a ſupply of 20,000 foot and 200 chariots, under the command

mand of Memnon, ſon of Tithonus, preſident of Perſia. But this is not confirmed by any other author. Sardanapalus was the laſt, and by all accounts the moſt effeminate, of theſe ancient Aſſyrian kings. Hiſtorians have unanimouſly reprobated his character. We by no means wiſh to defend it, but we cannot help remarking, that moſt of thoſe princes, upon whom they have beſtowed the name of *Great*, are much worſe characters than Sardanapalus. The indolent and effeminate prince, who devotes his whole time to his pleaſures, is at leaſt a *harmleſs animal*, compared with the ambitious monſter, who ſacrifices millions of his fellow mortals to his glory or his avarice. And perhaps, had hiſtorians, inſtead of celebrating as *heroiſm*, the murders and robberies committed by thoſe ſcourges of the human race, recorded their victories with the deteſtation they deſerved, mankind might have been bleſſed with more Sardanapali, and curſed with fewer Nebuchadnezzars, Alexanders, and Cæſars. But leaving ſimilar remarks to the reader's philanthropy, we have only to add that Arbaces, governor of Media, taking advantage of Sardanapalus's indolence, withdrew his allegiance, and rebelled againſt him. He was encouraged in this revolt by the advice and aſſiſtance of Beleſis, a Chaldean prieſt, who engaged the Babylonians to follow the example of the Medes. Theſe powerful provinces, aided by the Perſians and other allies, who deſpiſed the effeminacy, or dreaded the tyranny of their Aſſyrian lords, attacked the empire on all ſides. Their moſt vigorous efforts were, in the beginning, unſucceſsful. Firm and determined, however, in their oppoſition, they at length prevailed, defeated the Aſſyrian army, beſieged Sardanapalus in his capital, which they demoliſhed, and became maſters of the empire, A. A. C. 821. After the death of Sardanapalus, the Aſſyrian empire was divided into three kingdoms, viz. the Median, Aſſyrian, and Babylonian. Arbaces retained the ſupreme power and authority, and fixed his reſidence at Ecbatana in Media. He nominated governors in Aſſyria and Babylon, who were honoured with the title of *kings*, while they remained ſubject and tributary to the Median monarchs. Beleſis received the government of Babylon as the reward of his ſervices; and Phul was entruſted with that of Aſſyria. The Aſſyrian governor gradually enlarged the boundaries of his kingdom, and was ſucceeded by Tiglath-pileſer, Salmanaſar, and Sennacherib, who aſſerted and maintained their independency. After the death of Eſar-haddon, the brother and ſucceſſor of Sennacherib, the kingdom of Aſſyria was ſplit, and annexed to the kingdoms of Media and Babylon. Several tributary princes afterwards reigned in Nineveh; but no particular account of them is found in the annals of ancient nations. We hear no more of the kings of Aſſyria, but of thoſe of Babylon. Cyaxares king of Media, aſſiſted Nebuchadnezzar king of Babylon, in the ſiege of Nineveh, which they took and deſtroyed, A. A. C. 606.

(3.) ASSYRIA, PRESENT STATE OF. This ancient empire is now almoſt entirely ſubject, either to the Turks or Perſians; being divided into three provinces, now called CURDISTAN, DIARBEC, the ancient Meſopotamia, and IRAK ARABIC, the ancient Chaldea. For farther particulars, reſpecting its modern ſtate, ſee theſe articles.

ASSYRIAN LETTERS, a denomination given by ſeveral Rabbins and Talmudiſts, to the characters of the preſent Hebrew alphabet, aſſerting them to have been borrowed from the Aſſyrians during the Jewiſh captivity in Babylon.

ASSYRIANS, the inhabitants of ASSYRIA. See § 2.

ASSYTHMENT. See ASSITHMENT.

(1.) ASTA, an inland town of Liguria, a Roman colony, on the river Tanarus, now called ASTI. Lon. 8. 15. E. Lat. 44. 40. N.

(2.) ASTA, or ASTA REGIA, a town of Bætica, ſituated at the mouth of the Bætis, (which is now choaked up with mud,) north of Cadiz, about 20 miles diſtant from its port. Its ruins ſhew its former greatneſs. Its name is Phœnician, ſignifying a *frith* or arm of the ſea, on which it ſtood. It is ſaid to be the ſame with Asta, which ſee.

ASTABAT, a town of Armenia, in Asturia, 12 miles from the river Aras, and 12 ſouth of Naſchivan. The land about it is excellent, and produces very good wine; and a root peculiar to the country, called RONAS, which dies a beautiful red. Lon. 46. 30. E. Lat. 38. 28. N.

ASTÆUS, a ſpecies of the crab inſect.

ASTAKILLOS, a denomination given by Paracelſus to a malignant gangrenous ulcer in the legs, occaſioned by a mercurial ſalt in the blood. This is alſo called by him *araneus*, and *araneum*, the ſpider's ulcer.

ASTALIN, the ſame with ASTANDA.

ASTANDA, in antiquity, a royal courier or meſſenger, the ſame with ANGARUS.—Darius king of Perſia is ſaid by Plutarch, in his book of the fortune of Alexander, to have formerly been an *aſſiando*.

ASTARILÆ, } or ASTAROTHITES, a name
ASTARITÆ, } given to thoſe Jews who worſhipped Aſtaroth.

ASTAROTH. See ASHTAROTH.

(1.) ASTARTE, in ancient geography, a city on the other ſide Jordan; one of the name Rabbah Ammon, in Arabia Petræa.

(2.) ASTARTE, in pagan mythology. See ASTAROTH.

ASTATI, in the 9th century, the followers of one Sergius, who renewed the errors of the MANICHEES. They prevailed much under the emperor Nicephorus; but his ſucceſſor, Michael Curopalates, curbed them with very ſevere laws.

ASTBURY, a village 2 miles from Congleton.

ASTEISM, in rhetoric, a genteel irony, or ſome way of deriding another. Dionyſius Halicarnaſſeus makes the characteriſtic of this figure, or ſpecies of irony, in that it is not groſs and ruſtic, but urbane and polite. Such, *e. gr.* is that of Virgil:

Qui Bavium non odit, amet tua carmina, Mævi.

ASTELL, Mary, an ornament of her ſex and country, was the daughter of an opulent merchant at Newcaſtle upon Tyne, where ſhe was born about 1668. She was educated in a manner ſuitable to her ſtation; and amongſt other accompliſhments, was miſtreſs of the French, and had ſome knowledge of the Latin tongue. Her father, a clergyman, obſerving in her ſome marks of pro-

promiſing genius, took her under his tuition, and taught her mathematics, logic, and philoſophy. She left the place of her nativity when ſhe was about 20 years of age, and ſpent the remaining part of her life at London and at Chelſea. Here ſhe purſued her ſtudies with great aſſiduity, made great proficiency in the above mentioned ſciences, and acquired a more complete knowledge of many claſſic authors. Among theſe Seneca, Epictetus, Hierocles, Antonius, Tully, Plato, and Xenophon, were her principal favourites. Her life was ſpent in writing for the advancement of learning, religion, and virtue; and in the practice of thoſe religious duties which ſhe ſo zealouſly and pathetically recommended to others, and in which perhaps no one was ever more ſincere. Her ſentiments of piety, charity, humility, and other Chriſtian graces, were uncommonly refined and ſublime; and religion ſat gracefully upon her, unattended with any forbidding airs of gloom.—Her mind was generally calm and ſerene; and her converſation was innocently facetious, and highly entertaining. She would ſay, "The good Chriſtian only hath reaſon, and he always ought, to be cheerful; and, that dejected looks and melancholy airs were very unſeemly in a Chriſtian." She was remarkably abſtemious; and ſeemed to enjoy an uninterrupted ſtate of health till a few years before her death, when, having one of her breaſts cut off, it ſo much impaired her conſtitution, that ſhe did not long ſurvive it. This painful operation ſhe underwent without diſcovering the leaſt timidity, or ſo much as uttering a groan; and ſhowed the ſame reſolution and reſignation during her whole illneſs. When ſhe was confined to her bed by a gradual decay, and the time of her diſſolution drew near, ſhe ordered her ſhroud and coffin to be made and brought to her bedſide, to keep her mind fixed on proper contemplation. She died in 1731, aged 63 and was buried at Chelſea. She wrote, 1. A Serious Propoſal to the Ladies. 2. An Eſſay in Defence of the Female Sex. 3. Letters concerning the Love of God. 4. Eſſays upon Marriage, Croſſes in Love, and Friendſhip. 5. Moderation truly ſtated. 6. The Chriſtian Religion, as profeſſed by a daughter of the Church of England. 7. Bart'lemey Fair, or an inquiry after wit; and ſome other works.

ASTENA, a genus of worms of the moluſca order, in the Linnæan ſyſtem.

(1.) ASTER, in ancient pharmacy, a kind of medicine, invented by Andromachus, againſt defluxions, and divers pains.

(2.) ASTER, in botany, STARWORT: A genus of the polygamia ſuperflua order, belonging to the ſyngeneſia claſs of plants; and in the natural method ranking under the 49th order, *Compoſitæ diſcoides*. The receptacle is naked; the pappus is ſimple; the rays of the corolla are 10; and the calyx is imbricated. There are above 30 ſpecies. All of them may be raiſed from ſeed ſown either in autumn or ſpring: but the greateſt part of them being perennial plants, and increaſing greatly at the roots, are generally propagated by parting their roots early in the ſpring, and they will grow in almoſt any ſoil or ſituation; and the larger ſorts increaſe ſo faſt, that, if not prevented, they will in a little time run over a large ſpace of ground. They grow in the beſt ſhade: the lower kinds do not run ſo much at the root, but ſhould be taken up and tranſplanted every other year; which will make them produce much fairer flowers.—Some few ſorts, which are natives of warm climates, will require artificial heat to raiſe them, if not to preſerve them.

(3.) ASTER, in mineralogy, a ſpecies of Samian earth.

(4.) ASTER, in zoology. See ASTERIAS.

(1.) ASTERBAD, a province in the NE. part of Perſia, having Tabriſtan on the W. part of the Caſpian Sea and part of Jorjan on the N. Koraſan on the E. and Koumas on the S. It is a mountainous country, except near the banks of the rivers that almoſt ſurround it, where it is pleaſant and fruitful, producing grapes of a prodigious ſize. In other parts the ſoil is ſandy and barren.

(2.) ASTERABAD, or ASTRABAD, the chief town of the above province which gives name to a gulph in the Perſian Sea, at the bottom of which it ſtands; 200 miles N. of Iſpahan. Lon. 54. 35. E. Lat. 37. 36. N.

ASTERAC, or ESTERAC, a ci-devant diſtrict of France, in Armagnac, now included in the department of Gers. It is fertile and populous.

(1.) ASTERIA, a gem, uſually called the *cat's eye*, or *oculis cati*. It is a very ſingular and very beautiful ſtone, and ſomewhat approaches to the nature of the opal, in having a bright included colour, which ſeems to be lodged deep in the body of the ſtone, and ſhifts about, as it is moved, in various directions: but it differs from the opal in all other particulars, eſpecially in its want of the great variety of colours ſeen in that gem, and in its ſuperior hardneſs. It is uſually found between the ſize of a pea and the breadth of a ſixpence; is almoſt always of a ſemicircular form, broad and flat at the bottom, and rounded and convex at the top; and is naturally ſmooth and poliſhed. It has only 2 colours, a pale brown and a white; the brown ſeeming the ground, and the white playing about in it, as the fire colour in the opal. It is conſiderably hard, and will take a fine poliſh, but is uſually worn with its native ſhape and ſmoothneſs. It is found in the E. and W. Indies, and in Europe. The iſland of Borneo affords ſome very fine ones, but they are uſually ſmall; they are very common in the ſands of rivers in New Spain; and in Bohemia they are often found immerſed in the ſame maſſes of jaſper with the opal.

(2.) ASTERIA, an extraneous foſſil, called in Engliſh the STAR-STONE. Theſe foſſils are ſmall, ſhort, angular, or ſulcated columns, between one and two inches long, and ſeldom above a third of an inch in diameter: compoſed of ſeveral regular joints; when ſeparated, each reſembles a radiated ſtar. They are, not without reaſon, ſuppoſed to be a part of ſome ſea fiſh petrified, probably the aſterias or ſea-ſtar. The aſteria is alſo called ASTRITES, ASTROITES, and ASTERISCUS. They may be reduced to two kinds: thoſe whoſe whole bodies make the form of a ſtar; and thoſe which in the whole are irregular, but are adorned as it were with conſtellations in the parts. Dr Liſter, for

for diſtinction's ſake, only gives the name *aſteria* to the former ſort, diſtinguiſhing the latter by the appellation of *aſtroites*; other naturaliſts generally uſe the two indiſcriminately. The aſterial ſpoken of by the ancients appears to be of this latter kind. The quality of moving in vinegar, as if animated, is ſcarce perceivable in the aſtroites, but is ſignal in the aſteria. The former muſt be broken in ſmall pieces before it will move; but the latter will move, not only in a whole joint, but in two or 3 knit together. The curious frequently meet with theſe ſtones in many parts of England: at Cleydon in Oxfordſhire they are found rather larger than common, but of a ſofter ſubſtance; for, on being left a ſmall ſpace of time in a ſtrong acid, they may eaſily be ſeparated at the joints in ſmall plates.

(3.) ASTERIA, in zoology, a name by which ſome authors have called the *falco paluмbarius*, or *goſhawk*. See FALCO.

(I.) ASTERIAS, STAR-FISH, or SEA-STAR, in zoology, a genus of inſects of the order of vermes molluſca. It has a depreſſed body, covered with a coriaceous coat; is compoſed of five or more ſegments, running out from a central part, and furniſhed with numerous tentacula; and has the mouth in the centre.—The conformation of the mouth is this: The under part of each lobe runs towards a point with the reſt at the centre of the body; and theſe ſeveral productions of the rays make a ſort of lips, the ends of each of which are armed with a number of ſharp teeth, which ſerve to take and convey the food into the body. From this mouth there goes a ſeparate canal to all or many of the rays, which runs through their whole length, and becomes gradually narrower as it approaches the extremity. The tentacula reſemble the horns of ſnails, but ſerve the animal to walk with. They are capable of being contracted or ſhortened: and it is only at the creatures moving that they are ſeen of their full length; at other times, no part of them is ſeen but the extremity of each, which is formed like a ſort of button, being ſomewhat larger than the reſt of the horn. Ariſtotle and Pliny called this genus *acus*, and *ſtella marina*, from their reſemblance to the pictured form of the ſtars of heaven; and they aſſerted that they were ſo exceedingly hot, as inſtantly to conſume whatſoever they touched! The foſſil world has been greatly enriched by the fragments and remains of the ſeveral pieces of ſtar fiſh which have been converted into ſtones. See ASTERIA. N° 2. There are many ſpecies of this genus: ſome of 12, 13, and even 14 rays. Moſt of them are found in our ſeas. See *Pl.* XIII. *fig* 10, 11, 12, and 13.

1. ASTERIAS CAPUT MEDUSÆ, or arboreſcent ſea-ſtar, has 5 rays iſſuing from an angular body; the rays dividing into innumerable branches, growing ſlender as they recede from the baſe. Theſe the animal, in ſwimming, ſpreads like a net to their full length; and when he perceives any prey within them, draws them in again, thus catching it with all the dexterity of a fiſherman. It is an inhabitant of every ſea, and is called by ſome the MAGELLANIC STAR FISH, and BASKET FISH.—When it extends its rays fully, it forms a circle of near 3 feet in diameter. The fragments of theſe rays furniſh the foſſil entrochi. If we drown this animal in brandy or ſpirits of wine, and keep the rays flat and expanded in the execution, it is eaſy to extract, by means of a pair of forceps, the ſtomach of the animal whole and entire through the mouth.

2. ASTERIAS CLATHATRA, or cancellated ſea-ſtar, with five ſhort thick rays, hirſute beneath, cancellated above, is found on our coaſts, but is rare.

3. ASTERIAS DECACNEMOS has ten very ſlender rays, with numbers of long beards on the ſides; the body is ſmall, and ſurrounded beneath with ten filiform rays. It inhabits the weſtern coaſts of Scotland.

4. ASTERIAS GLACIALIS, with five rays, depreſſed, round at the baſe, yellow, and having a round ſtriated operculum on the back, is the moſt common; it feeds on oyſters, and is very deſtructive to the beds.

5. ASTERIAS HISPIDA, with 5 rays, broad, angulated at top, and rough with ſhort briſtles, is of a brown colour, and is found about Angleſea.

6. ASTERIAS OCULATA, with five ſmooth rays, dotted or punctured, is of a fine purple colour, and is alſo found about Angleſea.

7. ASTERIAS PLACENTA, with five very broad and membraneous rays, extremely thin and flat, is found about Weymouth.

8. ASTERIAS SPHERULATA, with a pentagonal indented body; a ſmall globular bead between the baſe of each ray; the rays ſlender, jointed, taper, and hirſute on their ſides; is found off Angleſea.

(II.) ASTERIAS, in ornithology, the ancient name of the bittern. See ARDEA. N° II. § 10 & 11.

ASTERION, in aſtronomy, one of the *canes venatici*.

ASTERISCUS, *aſteriodes bupbthalmum*, in botany, the ox eye.

(1.) * ASTERISK. *n. ſ.* [ἀστερίσκος.] A mark in printing or writing, in form of a little ſtar; as *. —He alſo publiſhed the tranſlation of the Septuagint by itſelf, having firſt compared it with the Hebrew, and noted by *aſteriſks* what was defective, and by obeliſks what was redundant. *Grew.*

(2.) ASTERISKS are uſed in this work to diſtinguiſh the articles taken *verbatim from Dr Johnſon's Dictionary:* an aſteriſk being prefixed to each, as in laſt and next articles.

* ASTERISM. *n. ſ.* [*aſteriſmus*, Lat.] 1. A conſtellation.—Poetry had filled the ſkies with *aſteriſms*, and hiſtories belonging to them; and then aſtrology deviſes the feigned virtues and influences of each *Bentley's Sermons.* 2. An aſteriſk, or mark. This is a very improper uſe.—Dwell particularly on paſſages with an *aſteriſm* *; for the obſervations which follow ſuch a note, will give you a clear light. *Dryden's Dryſdrey.*

ASTERIUS, or ASTURIUS, a Roman conſul, who lived about A. D. 449. He wrote *A Conference on the Old and New Teſtament*, in Latin verſe, which is extant, and in which each ſtrophe contains, in the firſt verſe, an hiſtorical fact in the Old Teſtament: and in the 2d an application of that fact to ſome point in the New.

(1.) * ASTERN. *adv.* [from *a* and *ſtern*.] In the hinder part of the ſhip; behind the ſhip.—

The

The galley gives her ſide, and turns her prow,
While thoſe *aſtern* deſcending down the ſteep,
Thro' gaping waves behold the boiling deep.
Dryden.

(2.) ASTERN is alſo uſed to ſignify any thing at ſome diſtance behind the ſhip; being the oppoſite of AHEAD, which ſignifies the ſpace before her. See AHEAD, § 2.

ASTEROPÆUS, a Trojan hero, who fought with Achilles, in ſingle combat, and proved him not invulnerable, by wounding him in the right arm; notwithſtanding which Achilles ſlew him.

ASTEROPHYTON, in natural hiſtory, a kind of fiſh, compoſed of a great number of cylindric rays, each branching out into ſeveral others, ſo as to repreſent the branched ſtalks of a very intricate ſhrub.

ASTEROPODIUM, a kind of extraneous foſſil, of the ſame ſubſtance with the aſteriæ or ſtar-ſtones, to which they ſerve as a baſe. See ASTERIA and STAR-STONE.

* *To* ASTERT. *v. a.* [a word uſed by *Spenſer*, as it ſeems, for *ſtart* or *ſtartle*.] To terrify; to ſtartle; to fright.—

We deem of death, as doom of ill deſert;
But knew we fools what it us brings until,
Die would we daily, once it to expert;
No danger there the ſhepherd can *aſtert*. *Spenſer.*

ASTERY, a river in Suſſex.

(1.) * ASTHMA. *n. ſ.* [ἀσθμα.] A frequent, difficult, and ſhort reſpiration, joined with a hiſſing ſound and a cough, eſpecially in the night-time, and when the body is in a prone poſture; becauſe then the contents of the lower belly bear ſo againſt the diaphragm. as to leſſen the capacity of the breaſt, whereby the lungs have leſs room to move. *Quincy.*

(2.) ASTHMA. See MEDICINE, *Index.*

* ASTHMATICAL. } *adj.* [from *aſthma.*]
* ASTHMATICK. }

Troubled with an aſthma.—In *aſthmatical* perſons, though the lungs be very much ſtuffed with tough phlegm, yet the patient may live ſome months, if not ſome years. *Boyle.*

(1.) ASTI, a city of Montferrat in Italy, capital of the county, (N° 2.) It has a biſhop's ſee; is well fortified with ſtrong walls and deep ditches: and is divided into the city, borough, citadel, and caſtle. There are a great many churches, convents, and other handſome buildings in it. It is ſeated on the Tanaro, 15 miles SW. of Caſſel. Lon. 8. 15. E. Lat. 44. 40. N.

(2.) ASTI, a county of Montferrat, very fertile, being well watered, and abounding with groves, pleaſant hills, and ſpacious fields. It was the ſcene of ſome of the late victories of the French, under Buonaparte.

ASTIER, ST, a town of France, in the department of Dordogne.

ASTIGI, in ancient geography, a colony, and conventus juridicus, of Bætica, ſituated on the angulus, which falls into the Bætis; called alſo COLONIA ASTIGITANA, and AUGUSTA FIRMA; now ECYA, midway between Seville and Cordova. Lon. 5. 0. W. Lat. 37. 20. N.

To ASTIPULATE. *v. a.* to covenant. *Bailey.*

ASTIPULATION. *n. ſ.* a mutual agreement.

ASTIPULATOR, in the Roman order, he by whoſe conſent and leave a nun takes the religious habit.

ASTLE, Thomas, an Engliſh antiquary, was the ſon of a farmer in Staffordſhire. After he had received a liberal education, Mr Grenville took him under his patronage, and about 1763, gave him a place along with Sir Joſeph Ayloffe and Dr Ducarel, in the ſuperintendance of the Weſtminſter records. In 1766 he was choſen to conduct the printing of the ancient records of parliament; and in 1775, was appointed principal clerk in the record office in the Tower; from which, on the death of Sir John Shelly, he ſucceeded to the office of keeper of the records. He died in December 1803. He was the author of many curious papers in the volumes of the Archæologia; alſo of a work entitled Origin and Progreſs of writing, as well hieroglyphic as elementary; which was firſt printed in 1784, 4to, and again in 1803.

ASTLEY, John, a native of Wem in Shropſhire, though he ſtudied painting under the ſame maſter with Sir Joſhua Reynolds, is more memorable as a favourite of fortune, than as a limner. His beſt pictures are copies of the Bentivoglio's, Titian's Venus, &c. But although he gained ſeveral thouſands by painting, he gained more by marriage, and ſtill more by death. Lady Daniel, having ſat for her picture, within a week after gave him the *original*, with the eſtate of Duckenfield, worth L. 5000 a year. His brother, being overrun by a waggon, left him L. 10,000. Eſtimating what he got by painting and by other legacies, he was worth conſiderably above L. 100,000. Of this he told Dr Warren, when languiſhing under the conſequences, he had ſpent L. 30,000 upon 7 years exceſſes; and in the ſelf diſapprobation of a retroſpective hour, declared he would give the remainder to redeem the time he had loſt! He died in 1787.

ASTOMI, in anthropology, a people feigned without mouths. Pliny ſpeaks of a nation of Aſtomi in India, who lived only by the ſmell or effluvia of bodies taken in by the noſe!

(1.) ASTON, Sir Arthur, an eminent commander in the ſervice of Charles I. was born at Fulham, in Middleſex. After making ſeveral campaigns abroad, he returned to England about the beginning of the civil war, when he entered eagerly into the king's cauſe. He commanded the dragoons at the battle of Edgehill, and three times defeated the earl of Eſſex. He was ſucceſſively governor of Reading and Oxford. He had the misfortune to break one of his legs in ſuch a manner as to make amputation neceſſary; and, ſerving in Ireland after the death of the king, when Cromwell took Drogheda, where Aſton was governor, his brains were beaten out with his wooden leg.

(2.) ASTON, Sir Thomas, was born in Cheſhire, of an ancient family, and educated at Brazen-noſe College, Oxford. He was created baronet in 1628, and appointed high ſheriff of Cheſhire in 1635. When the rebellion broke out, he raiſed a troop of horſe for the king, but was defeated and wounded in the vicinity of Nantwich in 1642. He was afterwards made priſoner, and carried to Stafford; and while he was endeavouring to make his eſcape,

a ſoldier ſtruck him on the head, which, with other wounds he had received, brought on a fever, which ended in his death, in 1643. Sir Thomas was author of, 1. A Remonſtrance againſt Preſbytery, 1641, 4to; 2. A Short ſurvey of the Preſbyterian Diſcipline; 3. Brief Review of the Inſtitution, Succeſſion, and Juriſdiction of Biſhops.

* ASTONIED. *part. adj.* A word uſed in the verſion of the bible for *aſtoniſhed*.—Many were *aſtonied* at thee. *Iſaiah*, liii. 14.—

Unmanly dread invades
The French *aſtony'd*. *J. Philips.*

* *To* ASTONISH. *v. a.* [*eſtonner*, Fr. from *attonitus*, Latin.] To confound with ſome ſudden paſſion, as with fear or wonder; to amaze; to ſurpriſe; to ſtun.—

It is the part of men to fear and tremble,
When the moſt mighty gods, by tokens, ſend
Such dreadful heralds to *aſtoniſh* us. *Shake p.*

* ASTONISHINGNESS. *n. ſ* [from *aſtoniſh*.] Of a nature to excite aſtoniſhment.

* ASTONISHMENT. *n. ſ.* [*eſtonnement*, Fr.] Amazement; confuſion of mind from fear or wonder.—We found, with no leſs wonder to us, than *aſtoniſhment* to themſelves, that they were the two valiant and famous brothers. *Sidney.*—She eſteemed this as much above his wiſdom, as *aſtoniſhment* is beyond bare admiration. *South.*

ASTORCHA, in botany, a name given by ſome botaniſts to the STOECHAS.

ASTORGA, a very ancient city of Spain, in the kingdom of Leon, with a biſhop's ſee, ſeated on the river Tuerta, and well fortified both by art and nature. It ſtands in a moſt agreeable plain, about 150 miles NW. of Madrid. Lon. 6. 20. W. Lat. 42. 30. N.

* *To* ASTOUND. *v. a.* [*eſtonner*, Fr.] To aſtoniſh; to confound with fear or wonder. This word is now ſomewhat obſolete.—

Theſe thoughts may ſtartle well, but not *aſtound*
The virtuous mind, that ever walks attended
By a ſtrong ſiding champion, conſcience. *Milt.*

ASTOUR, in commerce, diſcount. *Bailey.*

ASTRABAD. See ASTERABAD, N° 2.

(1.) ASTRACAN, a province of Ruſſia, and the moſt eaſterly part of Europe; bounded on the N. by Bulgaria and Baſkiria; on the S. by the Caſpian Sea; on the W. by the Volga, which divides it from the Nagayan Tartars and Don Coſſacks; and on the E. by the great ridge of mountains which ſeparate it from Great Tartary. The province extends from 46° to 52° Lat. The ſummer is long, and intenſely hot: the winter continues about three months ſo ſevere, that the Volga is frozen hard enough to bear loaded ſledges. The ſoil is rich and fertile; but the Tartars who inhabit it are ſtrangers to agriculture. On the weſtern and ſouthern ſides of the Volga are heaths of a prodigious extent, ſandy, deſert, and uncultivated: theſe, however, produce vaſt quantities of fine tranſparent ſalt in pits, where the ſun bakes and incruſtates it to the thickneſs of an inch on the ſurface of the water. There are pits in the neighbourhood of Aſtracan which yield this excellent ſalt in ſuch abundance, that any perſon may carry it off, paying at the rate of one farthing a poud, which is equal to 40 lb.

(2.) ASTRACAN, the metropolis of the province, (N° 1.) is ſituated within the bounds of Aſia, on an iſland called *Dolgoi*, about 6 miles above the mouth of the Volga. The city derives its name from Hadgee Turkan, a Tartar, by whom it was founded. It was taken by Iwan Baſilowitz, recovered by the Turks 1668, and retaken by the Czar, who employed for this purpoſe a great number of flat-bottomed veſſels, in which he tranſported his forces up the Volga from Caſan. It is about two miles and a half in circumference, ſurrounded by a ſtone wall, in a ruinous condition; but including the ſuburbs, near 5 miles. The number of its inhabitants amounts to 70,000, including Armenians, Tartars, and a few Perſians and Indians. The garriſon conſiſts of ſix regiments of the beſt Ruſſian troops, who, when this place was alarmed from the ſide of Perſia, had in the adjacent plain erected a great number of ſmall batteries, to keep the fields, and obſtruct the approach of the enemy. The houſes of Aſtracan are built of wood, and generally mean and inconvenient. The weſtern parts of the city command a proſpect of the Volga, which is here about three miles in breadth. The marſhy lands on the banks of it render the place very ſickly in ſummer. Aſtracan is a great ſea port, for the Perſian market. It lies 80 miles N. of the Caſpian Sea and 800 SW. of Moſcow. Lon. 47. 40. E. Lat. 46. 22. N. according to Walker. Others place it in Lon. 52. 5. E. and Lat. 47. 10. N.

(3.) ASTRACAN, COMMERCE OF. Formerly the inhabitants of Aſtracan traded to Kerman, Bokhara; but at preſent theſe branches are loſt, and their commerce is limited to Perſia and the dominions of Ruſſia. Even the trade to Perſia is much diminiſhed by the troubles of that country; nevertheleſs, the commerce of Aſtracan is conſiderable. Some years ago, the city contained about 40 veſſels, from 100 to 200 tons burden, for the Caſpian traffic. Some of theſe belong to the government, and are commanded by a commodore, under the direction of the admiralty. This office is generally well ſtocked with naval ſtores, which are ſold occaſionally to the merchants. The trading ſhips convey proviſions to the frontier towns of Terki and Kiſlar, that lie on the Caſpian Sea; and tranſport merchandiſe to ſeveral parts of Perſia. The merchants of Aſtracan export to Perſia, chiefly on account of the Armenians, red leather, linens, woollen cloths, and other European manufactures. In return they import the commodities of Perſia, particularly thoſe manufactured at Caſan; ſuch as ſaſhes intermixed with gold, for the uſe of the Poles; wrought ſilks and ſtuffs mixed with cotton; rice, cotton, rhubarb, and a ſmall quantity of other drugs; but the chief commodity is ſilk. The government has engroſſed the trade of rhubarb, the greater part of which is brought into Ruſſia by the Tartars of Yakutſki, bordering on the eaſtern Tartars belonging to China. They travel through Siberia to Samura, thence to Caſan, and laſtly to Moſcow.

(4.) ASTRACAN, PRODUCE, CLIMATE, &c. The earth of this province being impregnated with ſalt, is extremely fertile, and produces abun-

of fruit, the immoderate uſe of which is attended with epidemical diſtempers. Sickneſs is likewiſe the conſequence of thoſe annual changes in the atmoſphere produced by the floods in ſpring and autumn. All round the city of Aſtracan, at the diſtance of two miles, are ſeen a great number of gardens, orchards, and vineyards, producing all ſorts of herbs and roots. The grapes are ſo delicious, that they are preſerved in ſalt, and tranſported to court by land carriage at a prodigious expence; yet the wine of Aſtracan is very indifferent. The ſummer being generally dry, the inhabitants water their gardens by means of large wheels worked by wind or horſes, which raiſe the water to the higheſt part of the garden, from whence it runs in trenches to refreſh the roots of every ſingle tree and plant. The neighbouring country produces hares and partridges, plenty of quails in ſummer, with wild and water fowl of all ſorts in abundance. About ten miles below the metropolis (See N° 2.) there is a ſmall iſland called BOSMAITE, on which are built large ſtore-houſes for the ſalt, which is made about 12 miles to the eaſtward, and, being brought hither in boats, is conveyed up the Volga, in order to ſupply the country as far as Moſcow and Twere. The quantity of ſalt annually dug for theſe purpoſes amounts to ſome millions of pounds, the excluſive property of which is claimed by the crown, and yields a conſiderable revenue; for the ſoldiers and bulk of the people live almoſt entirely on bread and ſalt. The neighbourhood of theſe ſalt works is of great advantage to the fiſheries, which extend from hence to the Caſpian Sea, and reach SE. as far as YACK, even 100 miles above Zaritzen. The principal fiſh here caught are ſturgeon and beluga. Theſe, being ſalted, are put on board of veſſels, and ſent away in the ſpring, for the uſe of the whole empire, even as far as Peterſburg; but as fiſh may be kept freſh as long as it is frozen, the winter is no ſooner ſet in, than they tranſport great quantities of it by land through all the provinces of Ruſſia. Of the roes of the fiſh called *beluga*, which are white, tranſparent, and of an agreeable flavour, the fiſhers here prepare the caviare, which is in ſo much eſteem all over Europe. Theſe fiſheries were firſt eſtabliſhed by one Tikon Demedoff, a carrier, who ſettled in this place about 60 years ago, his whole wealth conſiſting of two horſes. By dint of ſkill and induſtry, he ſoon grew the richeſt merchant in this country: but his ſucceſs became ſo alluring to the crown, that of late years it hath engroſſed ſome of the fiſheries as well as the ſalt works. From the latter end of July to the beginning of October, the country about Aſtracan is frequently infeſted with myriads of locuſts, which darken the air in their progreſſion from N. to S. and, wherever they fall, conſume the whole verdure of the earth. Theſe inſects can even live for ſome time under water; for when the wind blows acroſs the Volga, vaſt numbers of them fall in cluſters, and are rolled aſhore; and their wings are no ſooner dry, than they riſe and take flight again.

(5.) ASTRACAN, REVENUE, RELIGION, &c. OF. The revenue of Aſtracan is computed at 150,000 rubles, or 33,000 pounds, ariſing chiefly from ſalt and fiſh. The city is ruled by a governor, under the check of a chancery. He is nevertheleſs arbitrary enough, and exerciſes oppreſſion with impunity. The officers of the admiralty and cuſtom-houſe having very ſmall ſalaries, are open to corruption, and extremely rapacious. At chriſtening feaſts, which are attended with great intemperance, the gueſts drink a kind of cherry-brandy out of large goblets; and every perſon invited throws a preſent of money into the bed of the mother, who ſits up with great formality to be ſaluted by the company. The Indians have a Pagan temple at Aſtracan, in which they pay their adoration, and make offerings of fruit to a very ugly deformed idol. The prieſts of this pagod uſe incenſe, beads, cups and proſtrations. The Tartars, on the contrary, hold idol-worſhip in the utmoſt abomination.

* ASTRADDLE. *adv.* [from *a* and *ſtraddle*.] With one's legs acroſs any thing. *Diſt.*

(1.) ASTRÆA, in aſtronomy, a name which ſome give to the ſign Virgo, by others called *Erigone*, and ſometimes *Iſis*.

(3.) ASTRÆA, in the mythology, the goddeſs of juſtice, and the daughter of Jupiter by Themis; or as others have it, by Nemeſis, the goddeſs of vengeance. The poets feign that Aſtræa quitted heaven to reſide on earth, in the golden age; but, growing weary of the iniquities of mankind, ſhe left the earth, and returned to heaven, where ſhe commenced a conſtellation of ſtars, and from her orb ſtill looks down on the ways of men.

(1.) * ASTRAGAL. *n. ſ.* [ἀστραγάλος, the ankle, or ankle-bone.] A little round member, in the form of a ring or bracelet, ſerving as an ornament at the top and bottoms of columns. *Builder's Dict.* —We ſee none of that ordinary confuſion, which is the reſult of quarter rounds of the *aſtragal*, and I know not how many other intermingled particulars. *Spectator.*

(2.) ASTRAGAL, in architecture, a little round moulding, which in the orders ſurrounds the top of the ſhaft or body of the column. It is alſo called the *talon* and *tondino*; it is uſed at the bottoms as well as the tops of columns, and on other occaſions; it properly repreſents a ring, on whatever part of a column it is placed; and the original idea of it was that of a circle of iron put round the trunk of a tree, uſed to ſupport an edifice to prevent its ſplitting. See Plate XX. fig. 2. The aſtragal is often cut into beads and berries, and is uſed in the ornamented entablatures to ſeparate the ſeveral faces of the architrave. See ARCHITECTURE, *Index*.

(3.) ASTRAGAL, in gunnery, a round moulding encompaſſing a cannon, about half a foot from its mouth.

ASTRAGALOIDES, in botany, the PHACA of Linnæus.

ASTRAGALOMANCY, [from ἀστράγαλος, and μαντεία, divination,] a ſpecies of divination performed by throwing ſmall pieces, with marks correſponding to the letters of the alphabet; the accidental diſpoſition of which formed the anſwer required. This kind of divination was practiſed in a temple of Hercules at Achaia.

ASTRAGALOTE, in natural hiſtory, a ſpecies

of foſſile alum, thus called, from its reſembling a *talus*, or ankle-bone; whence it is alſo denominated *talare*.

(1.) ASTRAGALUS, in anatomy. See ANATOMY, § 159.

(2.) ASTRAGALUS, in botany, MILK-VETCH, or LIQUORICE-VETCH: A genus of the decandria order, belonging to the diadelphia claſs of plants; and in the natural method ranking under the 32d order, *Papilionaceæ*, the pod is gibbous and bilocular. Of this genus there are 39 ſpecies.

1. ASTRAGALUS COMMUNIS, the common ſpecies grows wild upon dry uncultivated places, and is recommended by Mr Anderſon to be cultivated as proper food for cattle. See HUSBANDRY, *Index*.

2. ASTRAGALUS TRAGACANTHA is a thorny buſh growing in Crete, Aſia, and Greece, which yields the gum tragacanth. This is of ſo ſtrong a body, that a dram of it will give a pint of water the conſiſtence of a ſyrup, which a whole ounce of gum Arabic is ſcarce ſufficient to do. Hence its uſe for forming troches and the like purpoſes, in preference to the other gums.

* ASTRAL. *adj.* [from *aſtrum*, Lat.] Starry; belonging to the ſtars.—

Some *aſtral* forms I muſt invoke by pray'r,
Fram'd all of pureſt atoms of the air;
Not to their natures ſimply good or ill;
But moſt ſubſervient to bad ſpirits' will. *Dryden.*

ASTRALISH, among miners, is the ore of gold in its firſt ſtate.

ASTRANTIA, MASTERWORT: A genus of the digynia order, belonging to the pentandria claſs of plants; and in the natural method ranking under the 45th order, *Umbellatæ*. The involucrum is lanceolated, open, equal, and coloured. The ſpecies are two,

1. ASTRANTIA MAJOR, } both natives of the
2. ASTRANTIA MINOR, } alps, and poſſeſſing no remarkable properties.

ASTRAPÆA, in natural hiſtory, a name given by the ancients to a ſtone, ſince called, improperly, ASTRAPIA, and by ſome ASTRAPIAS. It was of a blue, or blackiſh ore, with white variegations, running in the form of waves and clouds. Some ſpecimens of the Perſian *lapis lazuli* are of this kind, but they are rare.

ASTRAPIA, or ASTRAPIAS. See laſt article.

ASTRARII, in writers of the middle age, the ſame with *manſionarii*, thoſe who live in the houſe, or family, at the time when a perſon dies.

ASTRARIUS HÆRES, [from *aſtre*, old Fr. a hearth,] is uſed in our old writers, where the anceſtor, by conveyance, hath ſet his heirs apparent, and his family, in a houſe, in his life-time.

* ASTRAY. *adv.* [from *a* and *ſtray*.] Out of the right way.—You run *aſtray*, for whilſt we talk of Ireland, you rip up the original of Scotland. *Spenſer*.

* *To* ASTRICT. *v. a.* [*aſtringo*, Lat.] To contract by application, in oppoſition to *relax*: a word not ſo much uſed as *conſtringe*.—The ſolid parts were to be relaxed or *aſtricted*, as they let the humours paſs either in too ſmall or too great quantities. *Arbuthnot on Aliments*.

(1.) * ASTRICTION. *n. ſ.* [*aſtrictio*, Lat.] The act or power of contracting the parts of the body by applications.—*Aſtriction* is in a ſubſtance that hath a virtual cold; and it worketh partly by the ſame means that cold doth. *Bacon*.

(2.) ASTRICTION, in law. See THIRLAGE.

(3.) ASTRICTION, in medicines, the operation of aſtringent medicines.

* ASTRICTIVE. *adj.* [from *aſtrict*] Styptick; of a binding quality. *Dict*.

* ASTRICTORY. *adj.* [*aſtrictorius*, Lat.] Aſtringent; apt to bind. *Dict*.

ASTRICUS LARIS, in natural hiſtory, a kind of figured ſtone, broken or cut from the *enaſtri*, after the ſame manner as the *trochitæ* from the *entrochi*.

* ASTRIDE. *adv.* [from *a* and *ſtride*.] With the legs open.—I ſaw a place, where the Rhone is ſo ſtraitened between two rocks, that a man may ſtand *aſtride* upon both at once. *Boyle*.

* ASTRIFEROUS. *adj.* [*aſtrifer*, Lat.] Bearing or having ſtars. *Dict*.

* ASTRIGEROUS. *adj.* [*aſtriger*, Lat.] Carrying ſtars. *Dict*.

ASTRILD, in ornithology, a ſpecies of the LOXIA.

* *To* ASTRINGE. *v. a.* [*aſtringo*, Lat.] To preſs by contraction; to make the parts draw together,—Tears are cauſed by a contraction of the ſpirits of the brain; which contraction, by conſequence, *aſtringeth* the moiſture of the brain, and thereby ſendeth tears into the eyes. *Bacon*.

* ASTRINGENCY. *n. ſ.* [from *aſtringe*.] The power of contracting the parts of the body; oppoſed to the power of *relaxation*.—Aſtriction prohibiteth diſſolution; as, in medicines, aſtringents inhibit putrefaction: and, by *aſtringents*, ſome ſmall quantity of oil of vitriol will keep freſh water long from putrifying. *Bacon*.

(1.) * ASTRINGENT. *adj.* [*aſtringens*, Lat.] Binding; contracting; oppoſed to *laxative*: it is uſed ſometimes of taſtes which ſeem to contract the mouth.—*Aſtringent* medicines are binding, which act by the aſperity of their particles, whereby they corrugate the membranes, and make them draw cloſer. *Quincy*.

(2.) ASTRINGENTS, in the materia medica, ſubſtances diſtinguiſhed by a rough, auſtere taſte, and changing ſolutions of iron, eſpecially thoſe made in the vitriolic acid into a dark purple or black colour; ſuch as galls, tormentil root, biſtort root, balauſtines, terra japonica, acacia, &c. See MATERIA MEDICA.

ASTROBOLISM, [from ἀστὴρ, a ſtar, and βάλλω, to ſtrike,] the ſame with *ſphacelus*; though properly applied to plants which are deſtroyed in the dog-days, as if blaſted by that ſtar.

ASTROCHITES, or ASTROITES. See ASTERIA, N° 2.

ASTRODICTICUM, an aſtronomical inſtrument invented by M. Weighelius, by means of which many perſons ſhall be able at the ſame time to behold the ſame ſtar.

ASTROGNOSIA, [from ἀστὴρ, ſtar, and γινώσκω, I know,] the art of knowing the fixed ſtars, their names, ranks, ſituations in the conſtellations, and the like. See ASTRONOMY.

* ASTROGRAPHY, *n. ſ.* [ἀστὴρ, and γράφω.] The ſcience of deſcribing the ſtars. *Dict*.

ASTROITES, or STAR-STONE. See ASTE-

RIA,

s, N° 2. and STAR-STONE; and *Plate* XIII. f. 14.

(1.) * ASTROLABE. *n. f.* [of ἀστὴρ, and λαμβάνω, to ke.] 1. An inſtrument chiefly uſed for taking altitude of the pole, the ſun or ſtars, at ſea.—A ſtereographick projection of the circles of the here upon the plain of ſome great circle. *Chamb.*

(2.) ASTROLABE, among the ancients, was the ne as our armillary ſphere.

(3.) ASTROLABE, among the moderns, is uſed PLANISPHERE, or a ſtereographic projection the ſphere, either upon the plane of the equa-, the eye being ſuppoſed to be in the pole of world; or upon the plane of the meridian, en the eye is ſuppoſed in the point of the inter-ſtion of the equinoctial and horizon.

* ASTROLOGER. *n. f.* [*aſtrologus*, Lat. from ἀστὴρ and λόγος.] 1. One that, ſuppoſing the in-ences of the ſtars to have a caſual power, pro-ſes to foretel or diſcover events depending on oſe influences.—A happy genius is the gift of ture: it depends on the influence of the ſtars, the *aſtrologers*; on the organs of the body, the naturaliſts; it is the particular gift of aven, ſay the divines, both Chriſtians and hea-ens. *Dryden.* 2. It was anciently uſed for one at underſtood or explained the motions of the nets, without including prediction.—A worthy *rologer*, by perſpective glaſſes, hath found in the rs many things unknown to the ancients. *Ra-gh.*

* ASTROLOGIAN. *n. f.* [from *aſtrology*.] The ne with *aſtrologer*.—The twelve houſes of hea-n, in the form which *aſtrologians* uſe. *Camden.*

* ASTROLOGICALLY. *adv.* [from *aſtrology*.] an aſtrological manner.

* ASTROLOGICAL. } *adj.* [from *aſtrology*.]
* ASTROLOGICK. } 1. Profeſſing aſtrolo-.—Some ſeem a little *aſtrological*, as when they arn us from places of malign influence. *Wotton.*

Relating to aſtrology.—*Aſtrological* prayers em to me to be built on as good reaſon as the redictions. *Stillingfleet.*

* *To* ASTROLOGIZE. *v. n.* [from *aſtrology*.] o practiſe aſtrology.

(1.) * ASTROLOGY. *n. f.* [*aſtrologia*, Lat.] he practice of foretelling things by the knowledge the ſtars; an art now generally exploded, as rational and falſe.—I know the learned think of e art of *aſtrology*, that the ſtars do not force the ſions or wills of men. *Swift.*

(2.) ASTROLOGY, [from ἀστὴρ, a ſtar, and λόγος, ſcourſe,] was long conſidered as a *Science*, by hich future events could be foretold, from the pects and poſitions of the heavenly bodies. In e literal ſenſe of the term, aſtrology ſhould fig-ify no more than the doctrine or ſcience of the ars; which was its original acceptation, and ade the ancient aſtrology; though, in courſe of me, an alteration has ariſen; that which the an-ents called aſtrology, being afterwards termed STRONOMY. Aſtrology may be divided into two ranches, *natural* and *judicial*.

(3.) ASTROLOGY, JUDICIAL OR JUDICIARY, hich is what we commonly call ſimple aſtrology, . that which pretends to foretel moral events; [illegible] as have a dependence on the free will [illegible] of man; as if they were directed by the ſtars. This art, which owed its origin to the practices of knavery on credulity, is now univerſally exploded by the intelligent part of mankind. The profeſſors of this kind of aſtrology maintain, "That the heavens are one great volume or book, wherein God has written the hiſtory of the world; and in which every man may read his own fortune, and the tranſactions of his time.—The art, they ſay, had its riſe from the ſame hands as aſtronomy itſelf. While the ancient Aſſyrians, whoſe ſerene unclouded ſky favoured their celeſtial obſervations, were intent on tracing the paths and periods of the heavenly bodies, they diſcovered a conſtant ſettled relation of analogy, between them and things below; and hence were led to conclude theſe to be the *Parcæ*, the deſtinies, ſo much talked of, which preſide at our births, and diſpoſe of our future fate. The laws therefore of this relation being aſcertained, by a ſeries of obſervations, and the ſhare each planet has therein; by knowing the preciſe time of any perſon's nativity, they were enabled, from their knowledge in aſtronomy, to erect a ſcheme or horoſcope of the ſituation of the planets, at that point of time; and hence, by conſidering their degrees of power and influence, and how each was either ſtrengthened or tempered by ſome other, to compute what muſt be the reſult thereof." Such are the arguments of the aſtrologers in favour of their ſcience. But the chief province, now remaining to the modern profeſſors, is the making of calendars or almanacks. Judicial aſtrology is commonly ſaid to have been invented in Chaldea, and thence tranſmitted to the Egyptians, Greeks, and Romans; though ſome will have it of Egyptian origin, and aſcribe the invention to Ham. But it is to the Arabs we owe it. At Rome the people were ſo infatuated with it, that the aſtrologers, or, as they were then called, the MATHEMATICIANS, maintained their ground in ſpite of all the edicts of the emperors to expel them out of the city. See GENETHLIACI. The Bramins, who introduced and practiſed this art among the Indians, have hereby made themſelves the arbiters of good and evil hours, which gives them great authority; they are conſulted as oracles; and they have taken care never to ſell their anſwers but at good rates. The ſame ſuperſtition has prevailed in more modern ages and nations. The French hiſtorians remark, that in the time of queen Catherine de Medicis, aſtrology was ſo much in vogue, that the moſt inconſiderable thing was not to be done without conſulting the ſtars. And in the reign of king Henry III. and IV. of France, the predictions of aſtrologers were the common theme of the court converſation. This predominant humour in that court was well rallied by Barclay, in his Argenis, on occaſion of an aſtrologer, who had undertaken to inſtruct king Henry in the event of a war then threatened by the faction of the Guiſes.

(4.) ASTROLOGY, NATURAL, comprehends the predicting of natural effects; as, the changes of weather, winds, ſtorms, hurricanes, thunder, floods, earthquakes, &c. This art properly belongs to phyſiology, or natural philoſophy; and is only to be deduced *a poſteriori*, from phenomena and obſervations. For this ſpecies of aſtrology, Mr Boyle makes an apology, in his Hiſtory of the Air.

ASTRO-

ASTROLUS, in natural hiſtory, a name given by authors to a white and ſplendid ſtone, ſmall in ſize, and of a roundiſh figure, reſembling the eyes of fiſhes.

ASTROMETEOROLOGIA, the art of foretelling the weather, and its changes, from the aſpects and configurations of the moon and planets. This makes a ſpecies of aſtrology, diſtinguiſhed by ſome under the denomination of *meteorological* aſtrology.

ASTRONIUM, in botany: A genus of the pentandria order, belonging to the dioecia claſs of plants. The male calyx conſiſts of five leaves, and the corolla is quinquepetalous: Of the female the calyx and corolla are the ſame as in the male; the ſtyli are three, and the ſeed is ſingle. There is but one ſpecies, viz.

ASTRONIUM GRAVEOLENS, a native of Jamaica.

* ASTRONOMER. *n. ſ.* [from ἀστρον, a ſtar, and νομος, a rule or law.] One that ſtudies the celeſtial motions, and the rules by which they are governed.—The motions of ſpheres under kings, ought to be like the motions, as the *aſtronomers* ſpeak of, in the inferiour orbs. *Bacon.*

* ASTRONOMICAL. ASTRONOMICK. *adj.* [from *aſtronomy.*] Belonging to aſtronomy.—Our forefathers marking certain mutations to happen in the ſun's progreſs through the zodiack, they regiſtrate and ſet them down in their *aſtronomical* canons. *Brown.*

ASTRONOMICAL CALENDAR, an inſtrument engraved on copper plates, printed on paper, and paſted on a board, with a braſs ſlider carrying a hair: it ſhows by inſpection the ſun's meridian altitude right aſcenſion, declination, riſing, ſetting, amplitude, &c. to a greater degree of exactneſs than the common globes.

ASTRONOMICAL PLACE of a ſtar or planet, is its longitude or place in the ecliptic, reckoned from the beginning of Aries *in conſequentia*, or according to the natural order of the ſigns.

ASTRONOMICAL SECTOR, a very uſeful mathematical inſtrument, made by the late ingenious Mr Graham; a deſcription of which is given in the courſe of the article ASTRONOMY.

ASTRONOMICALS, a name uſed by ſome writers for ſexageſimal fractions; on account of their uſe in aſtronomical calculations.

* ASTRONOMICALLY. *adv.* [from *aſtronomical.*] In an aſtronomical manner.

* ASTRONOMICK. See ASTRONOMICAL.

ASTRONOMICUS RADIUS. See RADIUS.

A S T R O N O M Y.

INTRODUCTION.

SECT. I. ETYMOLOGY *and* DEFINITIONS *of* ASTRONOMY.

(1.) * ASTRONOMY. *n. ſ.* [ἀστρονομια, from ἀστρον, a ſtar, and νομος, a law, or rule.] A mixed mathematical ſcience, teaching the knowledge of the celeſtial bodies; their magnitudes, motions, diſtances, periods, eclipſes, and order. Pythagoras taught that the earth and planets turn round the ſun, which ſtands immoveable in the centre.—To this muſt be added the underſtanding of the globes, and the principles of geometry and *aſtronomy*. *Cowley.*

(2.) ASTRONOMY comprehends alſo, a knowledge of the natural cauſes on which all the phænomena of the heavenly bodies depend: and in this view, it is as much a branch of phyſics as of mathematics, and comprehends the theory of the whole univerſe.

SECT. II. HISTORY *of* ASTRONOMY.

(3.) As ASTRONOMY is the moſt ſublime of all the Sciences, ſo it is alſo the moſt uſeful, and we may with equal veracity, add, that it is the moſt ancient. How can it be otherwiſe than ſublime, when its object is the ſtudy of that theatre which our merciful creator has vouchſafed to eſtabliſh, as an unerring teſtimony of his exiſtence and of his power; wherever we turn ourſelves we encounter immenſity of operation, guided by the ſtricteſt regularity! which ever way we view it, we find revolutions, intricate and complex, but reſolving themſelves by laws irrevocably fixed, into paths the moſt ſimple, and the moſt capable of ſuffering an increaſe of numbers without confuſion!—In another point of view it is ſublime: the contemplation of its diſcoveries and its uſefulneſs, would convince the dreary minded bigot, who meaſures all human reaſon and its efforts, of the almoſt limitable extent, to which that nobleſt gift of God to man can be extended. Aſtronomy is the triumph of philoſophy and of human reaſon! Its ſuperior uſefulneſs when compared with the other ſciences can never be oppoſed; by it the navigator is conducted through unknown ſeas with ſafety, by it the merchant tranſports the produce or the ſurplus of one nation, to increaſe the neceſſaries or relieve the wants of another; in ſhort it opens an intercourſe to all the inhabitants of the globe. If, from the folly of mankind, it has ſometimes been compelled to effect the tranſportation of animoſity and deſtruction, it has more frequently aſſiſted the diſſemination of arts and civilization, for thoſe ready for ſuch recourſes.—That it is the oldeſt ſcience we ſhall more clearly aſcertain, when we trace, as we ſhall ſoon do, its hiſtory through the moſt ancient, and its improvements, through the moſt modern nations.—If then aſtronomy is poſſeſſed of the higheſt antiquity, the greateſt uſefulneſs and the utmoſt ſublimity, it becomes the object the moſt tranſcendently worthy of the operations of the HUMAN MIND!

(4.) None of the ſciences appears to be of higher antiquity than aſtronomy. From the account given by Moſes, of the creation of the celeſtial luminaries, it appears extremely probable, that our firſt progenitor received ſome knowledge of them

r nature and uſes from his Almighty Creator ſelf. The Jewiſh Rabbins have adopted this nion: and, indeed, it is natural to think that viſible objects would more readily excite the ioſity, or appear more worthy of the contemtion of ADAM in a ſtate of innocence than cæleſtial bodies.

(5.) Conſiſtently with this, Joſephus aſcribes to H and his poſterity, a conſiderable degree of onomical knowledge. He ſpeaks of two pil-, the one of ſtone, and the other of brick, ed the pillars of Seth, upon which they engra- the principles of the ſcience; and he ſays that former was ſtill entire in his time. But be as it may, it is evident that the great length the antediluvian lives would afford ſuch excelt opportunities for obſerving the heavenly bos, that we cannot but ſuppoſe that the ſcience aſtronomy was conſiderably advanced before flood. Joſephus ſays, that longevity was bewed upon them, for the very purpoſe of cultiing the ſciences of geometry and aſtronomy; ſerving, that the latter could not be learned in then 600 years; "for that period, he adds, the *grand year*."

(6.) By this remarkable expreſſion, is probably ant, the period in which the ſun and moon me again into the ſame ſituation in which they re at the beginning of it, with regard to the des, apogee of the moon, &c. "This period s Caſſini, of which we find no intimation in y monument of any other nation, is the fineſt riod that ever was invented; for it brings out e ſolar year more exactly than that of Hipparus and Ptolemy; and the lunar month within out one minute of what is determined by moern aſtronomers." If the Antediluvians had ch a period of 600 years, they muſt have known e motions of the ſun and moon, more exactly, an their deſcendants knew them, for many as after the flood.

(7.) Indeed, beſides the motives of mere curioty, which of themſelves may be ſuppoſed, to ave excited people to a contemplation of the orious celeſtial canopy, as far as that was poſble, it is eaſily to be ſeen, that ſome parts of the ience anſwer ſuch eſſential purpoſes to mankind, at they could not long be poſſibly diſpenſed ith. And it has been remarked, that traces of is ſcience in different degrees of improvement, ave been found among all nations.

(8.) Upon the building of the Tower of Bael, it is ſuppoſed that Noah retired with his hildren born after the flood, to the north-eaſtern art of Aſia, where his deſcendants peopled the aſt empire of China. It is ſaid alſo, that the Jeuit miſſionaries have found traditional accounts mong the Chineſe, of their having been taught his ſcience, by their firſt emperer Fo-hi, who is ppoſed to be the ſame with Noah; and Kempr aſſerts, that Fo-hi diſcovered the motions of he heavens, divided time into years and months, nd invented the 12 ſigns, into which they divide he zodiac, and which they diſtinguiſh by the folowing names; 1, the mouſe; 2, the ox or cow; , the tiger; 4, the hare; 5, the dragon: 6, the rpent: 7, the horſe; 8, the ſheep; 9, the monkey; 10, the cock or hen; 11, the dog and 12, the boar. They divide the heavens into 28 conſtellations, or claſſes of ſtars, allotting 4 to each of the 7 planets; ſo that the year always begins with the ſame planet; and their conſtellations anſwer to the 28 lunar manſions uſed by the Arabian aſtronomers.

(9.) Theſe conſtellations, however, they do not mark with the figures of animals, like moſt other nations, but by connecting the ſtars by ſtraight lines, and denoting the ſtars themſelves by ſmall circles: ſo, for inſtance, the great bear would be marked as repreſented in Plate XXVIII. Fig. 10.

(10) The Chineſe themſelves have many records of the high antiquity of their aſtronomy: though not without ſuſpicions of great miſtakes. They aſcribe the diſcovery of the pole ſtar, the invention of the ſphere, and mariner's compaſs, &c. to their emperor Hong-Ti, the grandſon of Noah. But on more certain authority, it is aſſerted by Gaubil, that at leaſt 120 years before Chriſt, the Chineſe had determined by obſervation the number and extent of their conſtellations as they now ſtand; the ſituation of the fixed ſtars with reſpect to the equinoctial and ſolſtitial points; and the obliquity of the ecliptic, with the theory of eclipſes; and that they were, long before that, acquainted with the true length of the ſolar year, the method of obſerving meridan altitudes of the ſun, by the ſhadow of a gnomon, and of deducing from thence his declination, and the height of the pole.

(11.) The ſame miſſionary alſo ſays, that the Chineſe have yet remaining, ſome books of aſtronomy, which were written about 200 years before Chriſt; from which it appears, that the Chineſe knew the daily motion of the ſun and moon, and the time of the revolutions of the planets, many years before that period. Du Halde informs us, that Tcheou-cong, the moſt ſkilful aſtronomer that ever China produced, lived more than a thouſand years before Chriſt: that he paſſed whole nights in obſerving the celeſtial bodies, and arranging them into conſtellations, &c. At preſent, however, the ſtate of aſtronomy is but very low in that country, although it is cultivated at Peking, by public authority, in like manner as in moſt of the capital cities of Europe. This is aſcribed, by Dr Long, to a barbarous decree of one of their emperors, to burn all the books in the empire, excepting ſuch as related to agriculture and medicine.

(12.) Aſtronomy, according to Porphyry, muſt have been of very ancient ſtanding in the Eaſt. He informs us that when Babylon was taken by Alexander, there were brought from thence, celeſtial obſervations for the ſpace of 1903 years; which therefore muſt have commenced within 115 years after the flood, or within 15 years after building of Babel. Epigenes, according to Pliny, affirmed that the Babyloniens had obſervations of 720 years, engraven on bricks.

(13.) Achilles Tatius aſcribes the invention of aſtronomy to the Egyptians; and adds that their knowledge of that ſcience was engraven on pillars, and by that means tranſmitted to poſterity. BAILLY, in his elaborate hiſtory of ancient and modern Aſtronomy, endeavours to trace the ori-

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gin of this ſcience among the Chaldeans, Egyptians, Perſians, Indians, and Chineſe, to a very early period. And thence he maintains, that it was cultivated in Egypt and Chaldea, 2800 years before Chriſt; in Perſia, 3209: in India, 3101; and in China, 2952 years before that æra. He alſo apprehends, that aſtronomy had been ſtudied even long before this diſtant period, and that we are only to date its revival from thence.

(14.) M. BAILLY, in inveſtigating the antiquity and progreſs of aſtronomy among the Indians, examines and compares four ſets of aſtronomical Tables of the Indian philoſophers, viz. that of the Siameſe, explained by M. Caſſini in 1689; that brought from India, by M. le Gentil, of the Academy of Sciences; and two other manuſcript tables, found among the papers of M. de Liſle: all of which agree together, and refer to the meridan of Benares. It appears, that the fundamental epoch of the Indian aſtronomy, is a conjunction of the ſun and moon, which took place at the diſtance of 3102 A. A. C. And M. Bailly computes that ſuch a conjunction really then happened.

(15.) He farther obſerves, that, at preſent, the Indians calculate eclipſes, from obſervations made 5000 years ago; the accuracy of which, with regard to the ſolar motion, far exceeds that of the beſt Grecian aſtronomers. The lunar motions have been computed from the ſpace through which that luminary paſſes in 1,600,984 days.—They alſo uſe the cycle of 19 years, the ſame as that aſcribed by the Greeks to Meton. Their theory of the planets is better than that of Ptolemy, as they do not ſuppoſe the earth in the centre of the celeſtial motions, and believe that Venus and Mercury move round the ſun. Their aſtronomy alſo agrees with the moſt modern diſcoveries, with regard to the obliquity of the ecliptic, and the acceleration of the equinoctial points, &c. The inhabitants of Japan, of Siam, and of the Mogul's empire, have alſo been acquainted with aſtronomy, from time immemorial; and the celebrated obſervatory at Benares, is a monument both of the ingenuity of the Hindoos, and of their ſkill in that ſcience.

(16.) In the Tranſactions of the Royal Society of Edinburgh, vol. ii. Profeſſor PLAYFAIR has given a learned and ingenious diſſertation on the aſtronomy of the Bramins, in which the great accuracy and high antiquity of the ſcience among them is rendered extremely probable. It hence appears, that their tables and rules of computation have peculiar reference to an epoch, and to obſervations 3000 or 4000 years A. C. Other inſtances are there given of the very conſiderable degree of mathematical knowledge, employed in their precepts and calculations. But amongſt all theſe precepts and thoſe calculations, perhaps none will ſtrike the mind of the reader with greater force than the two following; in the firſt of which we ſhall find, without plucking a leaf from the never fading laurels of Sir I. Newton, that that immortal principle which he developed to the Weſtern world, was diſcovered by the Philoſophers of the Eaſtern, thouſands of years before he exiſted; and in the ſecond the ring of Saturn is exhibited to us by them, perhaps about the ſame time, anterior to its diſcovery by Huygens. Of the firſt we have a remarkable paſſage, tranſlated by Sir W. Jones form the Poem of Shirin and Ferhad: "there is," ſays the author of that poem, "a ſtrong propenſity which dances through every atom and attracts the minuteſt particle to ſome peculiar object; from ſuch propenſity ariſes every motion perceived in heavenly or terreſtrial bodies; it is a diſpoſition to be attracted which taught hard ſteel to ruſh from its place, and rivet itſelf on the magnet, it is the ſame diſpoſition which impels the light ſtraw to attach itſelf firmly to amber." As to the Ring of Saturn, their God Sani, who repreſents that planet ſurrounded by a ſerpent, is too conſpicuous not to be immediately recognized.

(17.) We ſhall conclude this part of the Hiſtory of Aſiatic diſcoveries in the words of Profeſſor Playfair. "That obſervations made in India, when all Europe was barbarous or uninhabited, inveſtigations into the moſt ſubtle effects of gravitation, made in Europe near five thouſand years afterwards, ſhould thus come in mutual ſupport of one another, is perhaps the moſt ſtriking example of the progreſs and vicſſitude of Science, which the Hiſtory of mankind has yet exhibited."

(18.) It appears too, that aſtronomy was not unknown to the Americans; though in their diviſion of time, they made uſe only of the ſolar, and not of the lunar motions. The Mexicans, in particular, had a ſtrange predilection for the number 13: their ſhorteſt periods conſiſted of 13 days; their cycle of 13 months, each containing 20 days; and their century of 4 periods of 13 years each: this exceſſive veneration for the number 13, aroſe, according to Siguenza, from its being the number of their greater gods. Clavigero alſo aſſerts it as a fact, that, having diſcovered the exceſs of a few hours in the ſolar, above the lunar year, they made uſe of intercalary days, to bring them to an equality, as was done by Julius Cæſar in the Roman calendar; but with this difference, that inſtead of one day every 4 years, they interpoſed 13 days every 52 years.

(19.) Thus have we introduced a people whoſe pretenſions to priority of diſcovery may well diſpute with thoſe of the Chaldeans and Egyptians; but we will ſtate the claims of the two laſt, and let our readers judge for themſelves. Among the Ancients we find the name of Chaldean uſed often for aſtronomer or aſtrologer. Indeed both theſe nations pretended to a very high antiquity, and claimed the honour of producing the firſt cultivators of this ſcience. The Chaldeans boaſted of their temple or tower of Belus, and of Zoroaſter, whom they placed 5000 years before the deſtruction of Troy; while the Egyptians boaſted of their colleges of prieſts, where aſtronomy was taught, and of the monument of Oſymandyas, in which, it is ſaid, there was a golden circle of 365 cubits in circumference, and one cubit thick, divided into 365 equal parts, according to the days of the year, &c. It is indeed evident that both Chaldea and Egypt were countries very proper for aſtronomical obſervations, on account of the extended flatneſs of the country, and the purity

f ſerenity of the air. The tower of Belus, or Babel itſelf, was probably an aſtronomical obſervatory; and the pyramids of Egypt, whatever y were originally deſigned for, might perhaps wer the ſame purpoſe; at leaſt they ſhew the of this people in practical aſtronomy, as they all placed with their four fronts exactly facing cardinal points of the compaſs.

(20.) The Chaldeans began to make obſervas ſoon after the confuſion of languages, as apfrom the obſervations found there on the ing of Babylon by Alexander; and it is proble they began much earlier. They determined, h tolerable exactneſs, the length both of a peſical and ſynodical month. They diſcovered, the motion of the moon was not uniform; they even attempted to aſſign thoſe parts of orbit in which the motion is quicker or ſlower. are aſſured by Ptolemy that they were not cquainted with the motion of the moon's apond nodes, the latter of which they ſuppoſed e a complete revolution in 6585⅓ days, or a more than 18 years, and contained 223 comlunations, which period is called the Chal- Saros.

(21.) Ptolemy alſo gives us from Hipparchus, ral obſervations of lunar eclipſes made at Baon above 720 years A. C. and Ariſtotle informs that they had many occultations of the plaand fixed ſtars by the moon; a circumſtance ch led them to conceive that eclipſes of the were to be attributed to the ſame cauſe. They alſo no inconſiderable ſhare in arranging the into conſtellations, and the comets did not pe their obſervation. Dialling was alſo pracd among them long before the Greeks were uainted with that ſcience.

(22.) The Egyptians were much of the ſame ding in Aſtronomy with the Chaldeans. Heotus aſcribes their knowledge in the ſcience to oſtris; but probably not the ſame whom Newmakes cotemporary with Solomon, as they e acquainted with aſtronomy at leaſt many dred years before that æra. We learn, from ſtimony of ſome ancient authors, that they ved the figure of the earth was ſpherical; t the moon was eclipſed by paſſing through the 's ſhadow, though it does not certainly apr that they had any knowledge of the true m of the univerſe; that they attempted to ſure the magnitude of the earth and ſun, ugh their methods of aſcertaining the latter e very erroneous; and that they even pretendto foretel the appearance of comets, as well as quakes and inundations. This ſcience, howr, gradually decayed, and in the time of Auus it was entirely extinct among them.

(23.) Aſtronomy paſſed from Chaldea and Egypt the Phœnicians, and was applied by that comrcial people, to the purpoſes of navigation, ring their courſe by the north polar ſtar. y became adventrous in their voyages, and quit- the ſhores, ſteered their courſe by one of the s in the urſa minor or little Bear, which being reſt to that point in the Heavens called the pole, e guide of the preſent navigator. Other nas attracted by brilliancy rather than by uſefulreckoned their courſe by the urſa major or great Bear, which from its changeableneſs could not direct them in long voyages; and from this cauſe they never ventured from Land." Thus the Phœnicians became maſters of the ſea, and of almoſt all the commerce in the world. The Greeks, it is probable, derived their aſtronomical knowledge chiefly from the Egyptians and Phœnicians, by means of ſeveral of their countrymen who viſited theſe nations, for the purpoſe of learning the different ſciences. Newton ſuppoſes that the diviſion into conſtellations was made about the time of the Argonautic expedition; but it is more probable that they were, at leaſt moſt part of them, of a much older date, and derived from other nations, though clothed in fables of their own invention or application.

(24.) The fable of Atlas ſupporting the heavens upon his ſhoulders, ſhows that ſome Mauritanian monarch of that name had made conſiderable advances in aſtronomical knowledge; and his diſcoveries had probably been communicated to the Greeks. Several of the conſtellations are mentioned by Heſiod and Homer, who lived about A. A. C. 870. Their knowledge in this ſcience however was greatly improved by Thales the Mileſian, and other Greeks, who travelled into Egypt, and brought from thence the chief principles of the ſcience. Thales was born about A. A. C. 640, and he was the firſt among the Greeks, who obſerved the ſtars, the ſolſtices, and predicted the eclipſes of the ſun and moon.

(25.) The ſcience was farther cultivated and extended by his ſucceſſors Anaximander, Anaximenes, and Anaxagoras; but eſpecially by Pythagoras, who, about A. A. C. 577, brought from Egypt the learning of theſe people, taught it in Greece and Italy, and founded the ſect of the Pythagoreans. He taught that the ſun was in the centre of the univerſe; that the earth was round; that there were antipodes; that the moon reflected the rays of the ſun, and was inhabited like the earth; that comets were a kind of wandering ſtars, diſappearing in the further parts of their orbits; that the white colour of the milky way was owing to the united brightneſs of a great multitude of ſmall ſtars; and he ſuppoſed that the diſtances of the moon and planets from the earth, were in certain harmonic proportions to one another.

(26.) Philolaus, a Pythagorean, who floriſhed about A. A. C. 450, and aſſerted the annual motion of the earth on her own axis, was taught by Hicetas, a Syracuſan. About the ſame time Meton and Euctemon, flouriſhed at Athens, where they obſerved the ſummer ſolſtice, A. A. C. 432. with the riſings and ſettings of the ſtars, and what ſeaſons they anſwered to. Meton alſo invented the cycle of 19 years, which ſtill bears his name.

(27.) Eudoxus, of Cnidos, lived about A. A. C. 370, and was one of the moſt ſkilful aſtronomers and geometricians of antiquity, and the inventor of many of the propoſitions in Euclid's Elements. He introduced geometry into the ſcience of aſtronomy, and travelled into Aſia, Africa, Sicily, and Italy, to improve it: and we are informed by Pliny, that he determined the annual year to contain 365 days, 6 hours, and alſo the periodical time of the planets, and made other important diſco-

veries and obſervations. Calippus flouriſhed ſoon after Eudoxus, and his celeſtial ſphere is mentioned by Ariſtotle; but he is better known by a period of 76 years which he invented, containing 4 corrected Metonic periods, and which commenced at the ſummer ſolſtice, A. A. C. 330. About this time the knowledge of the Pythagorean ſyſtem was carried into Italy, Gaul, and Egypt, by certain colonies of Greeks.

(28.) VITRUVIUS, however, repreſents the introduction of aſtronomy into Greece, in a manner ſomewhat different. He maintains, that Beroſus, a Babylonian, brought it immediately from Babylon itſelf, and opened an aſtronomical ſchool in the iſle of Cos. And Pliny ſays, that in conſideration of his wonderful predictions, the Athenians erected a ſtatue to him in the gymnaſium, with a gilded tongue. But if this Beroſus be the ſame with the author of the Chaldaic hiſtories, he muſt have lived before Alexander. About this time, or rather earlier, the Greeks having begun to plant colonies in Italy, Gaul, and Egypt, theſe became acquainted with the Pythagorean ſyſtem, and the notions of the ancient Druids concerning aſtronomy. Julius Cæſar informs us that the latter were ſkilled in this ſcience; and that the Gauls in general were able ſailors, which at that time they could not be without a competent knowledge of aſtronomy: and it is related of PYTHOAS, who lived at Marſeilles in the time of Alexander the Great, that he obſerved the altitude of the ſun at the ſummer ſolſtice by means of a gnomon. He is alſo ſaid to have travelled as far as Thule to ſettle the climates.

(29.) After Alexander's death, the ſciences flouriſhed chiefly in Egypt, under the auſpices of Ptolemy Philadelphus, and his ſucceſſors. He founded a ſchool there, which continued till the invaſion of the Saracens, A. A. C. 650. From the founding of that ſchool, the ſcience of aſtronomy advanced conſiderably. Ariſtarchus, about A. A. C. 270, ſtrenuouſly aſſerted the Pythagorean ſyſtem, and gave a method of determining the ſun's diſtance by the dichotomy of the moon.—Eratoſthenes, who was born at Cyrene, A. A. C. 271, meaſured the circumference of the earth by a gnomon; and being invited to Alexandria, from Athens, by Ptolemy Euergetes, and made keeper of the royal library there, he ſet up for that prince thoſe armillary ſpheres, which Hipparchus and Ptolemy the aſtronomer afterwards employed ſo ſucceſsfully in obſerving the heavens. He alſo determined the diſtance between the tropics to be $\frac{11}{83}$ of the whole meridian circle, which makes the obliquity of the ecliptic in his time to be 23° 51′ $\frac{1}{3}$.

(30.) The celebrated ARCHIMEDES, too, cultivated aſtronomy, as well as geometry and mechanics; determined the diſtances of the planets from one another; and conſtructed a kind of planetarium or orrery, to repreſent the phenomena and motions of the heavenly bodies.

(31.) Not to mention many others of the ancients, who cultivated aſtronomy, HIPPARCHUS, who flouriſhed about A. A. C. 140, was the firſt who applied himſelf to the ſtudy of every branch of that ſcience. Ptolemy ſays, he made great improvements in it; he diſcovered that the orbits of the planets are eccentric, that the moon moved ſlower in her apogee than in her perigee, and that there was a motion of anticipation of the moon's nodes: he conſtructed tables of the motions of the ſun and moon, collected accounts of ſuch eclipſes, &c. as had been made by the Egyptians and Chaldeans, and calculated all that were to happen for 600 years: he diſcovered that the fixed ſtars changed their places, having a ſlow motion of their own from W. to E. he corrected the Calippic period, and pointed out ſome errors in Eratoſthenes's method for meaſuring the circumference of the earth; he computed the ſun's diſtance more accurately than his predeceſſors: but his beſt work is a catalogue of the fixed ſtars, to the number of 1022, with their longitudes, latitudes and apparent magnitudes; which, with moſt of his other obſervations, are preſerved by Ptolemy in his Almageſt.

(32.) From the time of Hipparchus, till that of Ptolemy, little progreſs was made in aſtronomy. He was born at Peluſium in Egypt, in the firſt century, and made the greateſt part of his obſervations at the celebrated ſchool of Alexandria in that country. Profiting by thoſe of Hipparchus and other ancient aſtronomers, he formed a ſyſtem of his own, which, though erroneous, was implicitly followed for many ages by all nations. He compiled a great work, called the Almageſt, which contained the obſervations and collections of his predeceſſors in aſtronomy. This work was preſerved from the conflagration of the Alexandrian library by the Saracens, and tranſlated into Arabic, A. D. 827, and into Latin in 1230. The Greek original was not known in Europe till the beginning of the 15th century, when it was brought from Conſtantinople, then taken by the Turks, by George, a monk of Trapezond, by whom it was tranſlated into Latin; and various other editions have been ſince made.

(33.) From A. D. 800, till the beginning of the 14th century, the weſtern parts of Europe were immerſed in groſs ignorance, while the Arabians, profiting by the books they had preſerved from the wreck of the Alexandrian library, cultivated and improved all the ſciences, and particularly that of aſtronomy, in which they had many able profeſſors and authors. The caliph AL MAMUN firſt introduced a taſte for the ſciences into his empire. His grandſon AL MAMUN, who aſcended the throne in 814, was a great encourager and improver of the ſciences, eſpecially of aſtronomy. Having conſtructed proper inſtruments, he made many obſervations; determined the obliquity of the ecliptic to be 23° 35′; and under his auſpices a degree of the circle of the earth was meaſured a ſecond time in the plain of Singar, on the banks of the Red Sea.

(34.) About this time ALFERGANUS wrote elements of aſtronomy; and Albategnius, who flouriſhed about the year 880, greatly reformed it, by comparing his own obſervations with thoſe of Ptolemy. Hence he computed the motion of the ſun's apogee from Ptolemy's time to his own; ſettled the preceſſion of the equinoxes at one degree in 70 years; and fixed the obliquity of the ecliptic at 23° 35′. The tables which he compoſed, for the meridian of Aracta, were long eſteemed by the Arabians.

(35.) At

(35.) After this, though the Saracens had many eminent aſtronomers, ſeveral centuries elapſed without producing any very valuable obſervations, excepting thoſe of ſome eclipſes obſerved by EBN YOUNIS, aſtronomer to the caliph of Egypt, by means of which the quantity of the moon's acceleration ſince that time may be determined. Other eminent Arabic aſtronomers were, Arzachel, a Moor of Spain, who obſerved the obliquity of the ecliptic, and improved Trigonometry by conſtructing tables of ſines, inſtead of chords of arches, dividing the diameter into 300 equal parts. Alhazen his contemporary, wrote upon the twilight, the height of the clouds, the phænomenon of the horizontal moon, and firſt ſhewed the importance of the theory of refractions in aſtronomy.

(36.) ULUG BEG, grandſon of the celebrated Tamerlane, the Tartarian prince, a great proficient in practical aſtronomy, had very large inſtruments particularly a quadrant of about 180 feet high, with which he made good obſervations. From theſe he determined the latitude of Samarcand, his capital, to be 39° 37′ 23″; and compoſed aſtronomical tables for the meridian of the ſame ſo exact, that they differ very little from thoſe conſtructed afterwards by Tycho Brahe.—His principal work was his catalogue of the fixed ſtars, made from his own obſervations in the year 1437.

(37.) At this period, almoſt all Europe was immerſed in ignorance; which began to be diſpelled by the ſettlement of the Moors in Spain. The emperor Frederic II. about 1230, alſo began to encourage learning; reſtoring ſome decayed univerſities, founding a new one in Vienna; and cauſing the works of Ariſtotle and Ptolemy's Almageſt, to be tranſlated into Latin. Two years after this, John de Sacro Boſco, that is of Halifax, compiled from Ptolemy, Albategnius, Alfergan us, and other Arabic aſtronomers, his work *De Sphæra*, which was held in the greateſt eſtimation for 300 years after, and was honoured with commentaries by Clavius and other learned men.

(38.) In 1240, ALPHONSO, K. of Caſtile, not only cultivated aſtronomy himſelf, but greatly encouraged others; and by the aſſiſtance of ſeveral learned men corrected the tables of Ptolemy, and compoſed thoſe which were denominated from him the ALPHONSINE TABLES. About the ſame time, ROGER BACON, an Engliſh monk, wrote ſeveral tracts relative to aſtronomy, particularly of the lunar aſpects, the ſolar rays, and the places of the fixed ſtars; and about 1270, VITELLO, a Polander, compoſed a treatiſe on optics, in which he ſhewed the uſe of refractions in aſtronomy.

(39.) Till the time of PURBACH, who was born in 1423, little farther improvement was made in this ſcience. He compoſed new tables of ſines for every 10 minutes, making the radius 60, with 4 cyphers annexed. He conſtructed ſpheres and globes, and wrote ſeveral aſtronomical tracts; as, a commentary on Ptolemy's Almageſt; ſome treatiſes on arithmetic and dialling, with tables for various climates; new tables of the fixed ſtars reduced to the middle of that century; and he corrected the tables of the planets, making new equations to them where the Alphonſine tables were erroneous. In his ſolar tables, he placed the ſun's apogee in the beginning of Cancer; but retained the obliquity of the ecliptic 23° 33½′, as determined by the lateſt obſervations. He alſo obſerved ſome eclipſes, made new tables for computing them, and had juſt finiſhed a theory of the planets, when he died in 1462, being only 39 years of age.

(40.) PURBACH was ſucceeded in theſe labours by his pupil and friend, John Muller, commonly called Regiomontanus, who completed the epitome of Ptolemy's Almageſt, which Purbach had begun; and after the death of his friend was invited to Rome, where he made many aſtronomical obſervations. Being returned to Nuremberg in 1471, by the encouragement of Bernard Walther, a wealthy citizen, he made ſeveral inſtruments for aſtronomical obſervations, among which was an armillary aſtrolabe, like that uſed at Alexandria by Hipparchus and Ptolemy, with which and a good clock, then but a late invention, he made many obſervations. He made ephemerides for 30 years to come, ſhewing the lunations, eclipſes, &c.; printed the works of many of the moſt celebrated ancient aſtronomers, and wrote the theory of the Planets and Comets, and a treatiſe on Triangles, ſtill in repute for ſeveral good theorems; computing the table of ſines for every ſingle minute, to the radius 1000000, and introducing the uſe of tangents alſo into trigonometry.

(41.) After Muller's death, which happened at Rome in 1476, in his 40th year, Bernard Walther collected his papers, and continued the aſtronomical obſervations till his own death. The obſervations of both were collected by order of the ſenate of Nuremberg, and publiſhed there in 1544 by John Schoner: they were alſo afterwards publiſhed in 1618 by Snellius, at the end of the obſervations made by the Landgrave of Heſſe; and laſtly with thoſe of Tycho Brahe in 1666.

(42.) Walther was ſucceeded, as aſtronomer at Nuremberg, by JOHN WERNER, a clergyman, who obſerved the motion of the comet in 1500; and wrote ſeveral tracts on geometry, aſtronomy, and geography, in a maſterly manner; the moſt remarkable of which are thoſe concerning the motion of the 8th ſphere, or of the fixed ſtars: in this tract, by comparing his own obſervations, made in 1514, with thoſe of Ptolemy, Alphonſus, and others, he ſhewed that the motion of the fixed ſtars, ſince called the preceſſion of the equinoxes, is 1° 10′ in 100 years. He made alſo the firſt ſtar of Aries 26° diſtant from the equinoctial point, and the obliquity of the ecliptic only 23° 28′; conſtructed a planetarium, repreſenting the celeſtial motions according to the Ptolemaic hypotheſis; and publiſhed a tranſlation of Ptolemy's Geography, with a commentary, in which he firſt propoſed the method of finding the longitude at ſea by obſerving the moon's diſtance from the fixed ſtars. Werner died in 1528, aged 60.

(43.) NICOLAUS COPERNICUS roſe next, and made ſo great a figure in aſtronomy, that the true ſyſtem, diſcovered, or rather renewed by him, has been ever ſince ſtiled the COPERNICAN. He reſtored the old Pythagorean ſyſtem of the world, which had been ſet aſide from the time of Ptolemy. About A. D. 1507, he conceived doubts of the Ptolemaic ſyſtem, and entertained notions a-

bout the true one, which he gradually improved by a ſeries of aſtronomical obſervations, and the ſtudy of former authors. By theſe he formed new tables, and completed his work in 1530, containing a renovation of the new ſyſtem of the univerſe, in which all the planets are conſidered as revolving about the ſun. This work was printed in 1543, under the care of Schoner and Oſiander, by the title of *Revolutiones Orbium Cœleſtium*; and the author received a copy of it a few hours before his death, on the 23d of May 1543, he being then 70 years of age.

(44.) After the death of this great luminary of Aſtronomy, the ſcience and practice of it were greatly improved by Schoner, Nonius, Gemma, Friſius, Rothman, Byrgius, the Landgrave of Heſſe, &c. Schoner reformed and explained the calendar, improved the methods of making celeſtial obſervations, and publiſhed a treatiſe on coſmography. He died 4 years after Copernicus.—Nonius wrote ſeveral works on mathematics, aſtronomy, and navigation, and invented ſome uſeful and more accurate inſtruments than formerly: one of theſe was the aſtronomical quadrant, on which he divided the degrees into minutes by a number of concentric circles: the firſt was divided into 90 equal parts or degrees, the ſecond into 89, the third into 88, and ſo on to 46; ſo that, the index of the quadrant always falling upon or near one of the diviſions, the minutes are known by an eaſy computation.

(45.) APPIAN's chief work, *The Cæſarean Aſtronomy*, was publiſhed at Ingolſtadt in 1540; in which he ſhews, how to obſerve the places of the ſtars and planets by the aſtrolabe; to reſolve aſtronomical problems by certain inſtruments; to predict eclipſes, and to deſcribe the figures of them; and the method of dividing and uſing an aſtronomical quadrant. To theſe are added obſervations of 5 comets, one of which has been ſuppoſed the ſame with that obſerved by Hevelius, and if ſo, it ought to have returned again in the year 1789; but aſtronomers were diſappointed in their expectations.

(46.) GEMMA FRISIUS wrote a commentary on Appian's Coſmography, accompanied with many obſervations of eclipſes: he alſo invented the aſtronomical ring, and ſeveral other inſtruments uſeful in taking obſervations at ſea; and was the firſt who recommended a time-keeper for determining the longitude. Rheticus began a very extenſive work, being a table of ſines, tangents and ſecants, to a very large radius, and to every 10 ſeconds, or $\frac{1}{6}$ of a minute; which was completed by his pupil Valentine Otho, and printed in 1594.

(47.) WILLIAM IV, Landgrave of Heſſe Caſſel, applied himſelf to the ſtudy of aſtronomy, about A. D. 1561; and, with the beſt inſtruments which could then be procured, made a great number of obſervations, publiſhed by Snellius in 1618, and preferred by Hevelius to thoſe of Tycho Brahe. From theſe obſervations he formed a catalogue of 400 ſtars, with their latitudes and longitudes, adapted to the beginning of the year 1593.

(48.) TYCHO BRAHE, a Daniſh nobleman began his ſtudies about the ſame time with the Landgrave of Heſſe, and obſerved the great conjunction of Jupiter and Saturn: but finding the uſual inſtruments very inaccurate, he conſtructed many others much larger and more exact. In 1571, he diſcovered a new ſtar in the chair of Caſſiopeia; which induced him, like Hipparchus on a ſimilar occaſion, to make a new catalogue of the ſtars which he compoſed to the number of 777, and adapted their places to the year 1600. In 1576, by the favour of the king of Denmark, he built his new obſervatory, called URANIBURG, on the ſmall iſland Huenna, oppoſite to Copenhagen, which he very amply furniſhed with many large inſtruments, ſome of them ſo divided as to the ſingle minutes, and in others the arch might be read off to 10 ſeconds. One quadrant was divided according to the method invented by Nonius, that is by 47 concentric circles; but moſt of the reſt were divided by diagonals; a method of diviſion invented by Richard Chanceler, an Engliſhman. Tycho employed his time at Uraniburg to the beſt advantage, till the death of the king, when falling into diſcredit, he was obliged to remove to Holſtein: he afterwards introduced himſelf to the Emperor Rodolph, with whom he continued at Prague till his death in 1601.—Tycho was the inventor of a ſyſtem of aſtronomy, a kind of Semi-Ptolemaic, which he vainly endeavoured to eſtabliſh inſtead of the Copernican. His numerous works, however, ſhew that he was a man of great abilities; and his diſcoveries, together with those of Purbach and Regiomontanus, were collected and publiſhed together in 1621, by Longomontanus, the favourite diſciple of Tycho.

(49.) TYCHO, while reſiding at Prague with the emperor, prevailed on KEPLER to leave the univerſity of Glatz, and to come to him: and Tycho dying in 1601, Kepler enjoyed all his ſtudies, the title of mathematician to the emperor, and ordered him to finiſh the tables of Tycho Brahe, which he publiſhed in 1627, under the title of RODOLPHINE. He died about A. D. 1630 at Ratiſbon, where he was ſoliciting the arrears of his penſion. From his own obſervations and thoſe of Tycho, Kepler diſcovered ſeveral of the true laws of nature, by which the motions of the celeſtial bodies are regulated. He diſcovered that all the planets revolve about the ſun, not in circular, but in elliptical orbits, having the ſun in one of the foci of the ellipſe; that their motions are not equable, but varying, quicker or ſlower as they are near to the ſun, or farther from him; that the areas deſcribed by the variable line drawn from the planet to the ſun, are equal in equal times and always proportional to the times of deſcribing them; and that the cubes of the diſtances of the planets from the ſun, were in the ſame proportion as the ſquares of their periodic times or revolution. By obſervations alſo on comets, he concluded, that they are freely carried about among the orbits of the planets, in paths that are nearly rectilinear, but which he could not then determine.

(50.) At this time there were many other good proficients in aſtronomy; as Wright, Napier, Bayer, &c. WRIGHT made ſeveral good meridional obſervations of the ſun, with a quadrant of 6 feet radius, in the years 1594, 1595 and 1596; from which he greatly improved the theory of the ſun's motion, and computed more accurately

curately his declination, than any perſon had done before. In 1599, he publiſhed alſo, an excellent work, entitled, "Certain Errors in Navigation diſcovered and detected," containing a method which has commonly, though erroneouſly, been aſcribed to Mercator. To NAPIER we owe ſome excellent theorems and improvements in ſpherics, beſides the ever memorable invention of logarithms. BAYER, a German, publiſhed his URANOMETRIA, or the figures of all the conſtellations viſible in Europe, with the ſtars marked on them, and accompanied by names, or the letters of the Greek alphabet; a contrivance by which they may eaſily be referred to with diſtinctneſs and preciſion.

(51.) About the ſame time, aſtronomy was cultivated abroad by Mercator, Maurolycus, Maginus, Homelius, Schultet, Stevin, Galileo, &c. and in England by Thomas and Leonard Digges, John Dee, Robert Flood, Harriot, &c. The beginning of the 17th century was particularly diſtinguiſhed by the invention of teleſcopes, and the application of them to aſtronomical obſervations. The more diſtinguiſhed early obſervations with the teleſcope, were made by GALILEO, Harriot, Huygens, Hook, Caſſini, &c. It is ſaid that, from report only, Galileo made for himſelf teleſcopes, by which he diſcovered inequalities in the moon's ſurface, Jupiter's ſatellites, and the ring of Saturn; alſo ſpots on the ſun, by which he found out the revolution of that luminary on its axis; and he diſcovered that the nebulæ and milky way were full of ſmall ſtars.

(52.) Mr HARRIOT, who had previouſly been known only as an algebraiſt, made much the ſame diſcoveries as Galileo, and as early, if not more ſo, as appears by his papers not yet printed, in the poſſeſſion of the Earl of Egremont. And Mr HORROX, a young aſtronomer of great talents, found out in 1633, that the planet Venus would paſs over the ſun's diſc on the 24th of November, 1639; an event which he announced only to his friend Crabtree; and theſe two were the only perſons in the world that obſerved this tranſit. Horrox made alſo many other uſeful obſervations, and had even formed a new theory of the moon, taken notice of by Newton; but his early death, in the beginning of 1640, put a ſtop to his uſeful and valuable labours.

(53.) HEVELIUS, Burgomaſter of Dantzick, flouriſhed about the ſame time, and obſerved the ſpots and phaſes of the moon; from which obſervations, he compiled his *Selenographia*. An account of his apparatus is contained in his work entitled *Machina Cœleſtis*, a book now very ſcarce, as moſt of the copies were accidentally burnt, with the whole houſe and apparatus, in 1679.—Hevelius died in 1688, aged 76.

(54.) Doctor Hook, a contemporary of Hevelius, invented inſtruments with teleſcopic ſights, and cenſured the others. This occaſioned a ſharp diſpute between them; to ſettle which, Halley was ſent over to Hevelius to examine his inſtruments. The two aſtronomers made ſeveral obſervations together, very much to their ſatisfaction; and amongſt them was one of an occultation of Jupiter by the moon, when they determined the diameter of the latter to be 30′ 33″.

(55.) HUYGENS and FONTANA, before the middle of the 17th century, greatly improved the conſtruction of teleſcopes. The former conſtructed one of 123 feet, with which he obſerved the moon and planets, and diſcovered that Saturn was encompaſſed with a ring. With teleſcopes too, of 200 and 300 feet focus, Caſſini ſaw five ſatellites of Saturn, with his ſtones or belts, and the ſhadows of Jupiter's ſatellites paſſing over his body. In 1666, Azout applied a micrometer to teleſcopes, to meaſure the diameters of the planets, and other ſmall diſtances in the heavens: but an inſtrument of this kind had been invented before, by Gaſcoigne, though it was but little known abroad. To obviate the difficulties, ariſing from the great lengths of refracting teleſcopes, and the aberration of the rays, Merſennus firſt ſtarted the idea of making teleſcopes of reflectors, inſtead of lenſes, in a letter to Deſcartes; and in 1663 JAMES GREGORY of Aberdeen ſhewed how ſuch a teleſcope might be conſtructed.

(56.) Sir ISAAC NEWTON, after ſpending ſome time on the conſtruction of both ſorts of teleſcopes, found out the great inconvenience which ariſes to refractors from the different refrangibility of the rays of light; for which not finding a remedy, and purſuing the other kind, in 1672, he preſented to the Royal Society two reflectors, conſtructed with ſpherical ſpeculums. The inconvenience, however, ariſing from the different refrangibility of the rays of light, has ſince been fully obviated by Dollond.

(57.) Towards the end of the 17th, and beginning of the 18th century, practical aſtronomy rather languiſhed; but the ſpeculative part was carried to the higheſt perfection by Newton in his Principia, by Gavid Gregory, Keil, and others. Soon after this, great improvements of aſtronomical inſtruments began to take place, particularly in Britain. GRAHAM not only improved clocks and watch work, but alſo carried the accuracy of aſtronomical inſtruments to a ſurpriſing degree. He conſtructed the old eight-feet mural arch at the Royal Obſervatory, Greenwich, and a ſmall equatorial ſector for making obſervations out of the meridian; but he is chiefly remarkable for contriving the zenith ſector of 24 feet radius, and afterwards one of 12½ feet, with which Bradley diſcovered the aberration of the fixed ſtars. The reflecting teleſcope of Gregory and Newton was greatly improved by HADLEY, who preſented a very powerful inſtrument of that kind to the Royal Society in 1719. He invented alſo the reflecting quadrant or ſector, now called by his name, preſented to the ſociety in 1731, and now ſo univerſally uſeful at ſea, eſpecially where nice obſervations are required. It appears, however, that an inſtrument ſimilar to this in its principles, had been invented by Newton; and a deſcription, with a drawing of it, was given to him by Halley, when he was preparing for his voyage in 1701, to diſcover the variation of the needle: it has alſo been aſſerted, that Godfrey of Philadelphia, in America, made the ſame diſcovery, and the firſt inſtrument of this kind.

(58.) About the middle of this century, the conſtructing and dividing of large aſtronomical inſtruments were carried to great perfection by BIRD;

BIRD; and reflecting telescopes were not less improved by SHORT, who first executed the divided object glass micrometer, which had been proposed and described by Louville and others. Dollond also improved refracting telescopes, by means of his achromatic glasses: and the discoveries of HERSCHEL are owing to the amazing powers of reflectors of his own construction. Thus, the astronomical improvements in the present century have been chiefly owing to the inventions of, and improvements in the instruments, and to the establishment of regular observatories in England, France, and other parts of Europe.

(59.) ROEMER, a celebrated Danish astronomer, first made use of a meridional telescope; and, by observing the eclipses of Jupiter's satellites, first discovered the progressive motion of light, concerning which he read a dissertation before the Academy of Sciences at Paris, in 1675. FLAMSTEAD, appointed the first astronomer Royal at Greenwich, in 1675, observed, for 44 years, and gave a catalogue of 3000 stars with their places, to the year 1689; also new solar tables, and a theory of the moon according to Horrox; likewise, in Sir Jonas Moore's System of Mathematics, he gave a curious tract on the sphere, shewing how geometrically to construct eclipses of the sun and moon, as well as occultations of the fixed stars by the moon. Upon his tables were constructed, both Halley's tables, and Newton's theory of the moon. CASSINI, the first French Astronomer Royal, made many observations on the sun, moon, planets and comets, greatly improved the elements of their motions, erected the gnomon, and drew the celebrated miridian line in the church of Petronia at Bologna.

(60.) FLAMSTEAD was succeeded, in 1719, by Dr HALLEY, as Astronomer Royal at Greenwich, who had been sent at the early age of 21, to the island of St Helena, to observe the southern stars, and make the catalogue of them, published in 1679. In 1705, he published his *Synopsis Astronomiæ Cometicæ*, in which he ventured to predict the return of a comet in 1758 or 1759. He first discovered the acceleration of the moon, and gave a very ingenious method for finding her parallax, by three observed phases of a solar eclipse; published in the Philosophical Transactions, many learned papers, and amongst them, some concerning the use that might be made of the next transit of Venus, in determining the distance of the sun, from the earth; composed tables of the sun, moon, and all the planets, which are still in great repute; and recommended the method of determining the longitude, by the moon's distances from the sun, and certain fixed stars; a method which had before been noticed, and which has since been carried into execution.

(61.) A dispute concerning the figure of the earth, took place about this time. NEWTON had determined, from a consideration of the laws of gravity, and the diurnal motion of the earth, that the figure of it was an OBLATE SPHEROID, and flatted at the poles; but Cassini from the measures of Picart, supposed it to be an OBLONG SPHEROID, or lengthened at the poles. To settle this dispute, it was resolved, under Lewis XV. to measure two degrees of the meridian; one near the equator, and the other as near the pole as possible. For this purpose, the Royal Academy of Sciences sent to Lapland, Maupertuis, Clairault, Camus, and Le Monier; who were accompanied by Outhier, and Celsus, professor of anatomy at Upsal. On the southern expedition were sent Godin, Condamine, and Bouguer, to whom the king of Spain joined George Juan and Antonio de Ulloa. These set out in 1735, and returned at different times 1744, 1745, and 1746; but the former party who set out only in 1736, returned the year following: having both fulfilled their commission. Picart's measure was revised by Cassini and De la Caille, which, after his errors were corrected, was found to agree very well with the other two; and the result of the whole served to confirm the determination of the figure before laid down by Newton. On the southern expedition, the attraction of the great mountains of Peru was found to have a sensible effect on the plumb-line of one of the largest instruments, deflecting it 7 or 8 seconds from the true perpendicular.

(62.) In 1742, Dr BRADLEY succeeded, on the death of Dr Halley, as Astronomer Royal at Greenwich. The accuracy of his observations enabled him to detect the smaller inequalities in the motions of the planets and fixed stars. The consequence of his accuracy was, the discovery of the aberration of light, the nutation of the earth's axis, and a much greater degree of perfection to lunar tables. He observed the places, and computed the elements of the comets which appeared in the years 1723, 1736, 1743, and 1757; made new and accurate tables of the motions of Jupiter's satellites; and from a multitude of observations of the luminaries, constructed the most accurate table of refractions yet extant. He also, with a very large transit instrument, and a new mural quadrant of 8 feet radius, constructed by Bird in 1750, made an immense number of observations for settling the places of all the stars in the British catalogue, together with near 1500 places of the moon, the greater part of which he compared with Mayer's tables. Bradley died in 1761.

(63.) Astronomers elsewhere were equally assiduous in their endeavours to promote this science. The theory of the moon was particularly considered by Clairault, D'Alembert, Euler, Mayer, Simpson, and Walmsly, and especially Clairault, Euler, and Mayer, who computed complete sets of lunar tables: those of the last of these authors, for their superior accuracy, were rewarded with a premium of L. 3000, and brought into use in the computation of the Nautical Ephemeris, published by the Board of Longitude. The most accurate tables of the satellites of Jupiter were composed from observations by WARGENTIN, an excellent Swedish astronomer.

(64.) Among the many French astronomers who contributed to the advancement of the science, it was particularly indebted to DE LA CAILLE for an excellent set of solar tables; who, in 1751, went to the Cape of Good Hope to make observations in concert with the most celebrated astronomers in Europe, for determining the parallax of Mars and the moon, and thence, that of the sun, which it was concluded did not much exceed 10 seconds. Here he re-examined and adjusted

with great accuracy, the ſtars about the ſouthern pole; and alſo meaſured a degree of the meridian. In Italy the ſcience was aſſiduouſly cultivated by Bianchini, Boſcovich, Friſi, Manfredi, Zanotti, and many others; in Sweden, by Wargentin, already mentioned, Blingenſtern, Mallet, and Planman; and in Germany by Euler, Mayer, Lambert, Griſchow, and others.

(65.) In 1760, all the learned Societies in Europe made preparations for obſerving the tranſit of VENUS over the ſun, which had been predicted by Halley more than 80 years before, with the uſe that might be made of it in determining the ſun's parallax, and the diſtances of the planets from the ſun. The ſame exertions were repeated, to obſerve the tranſit in 1769, by ſending obſervers to different parts of the world; and from the whole, Short computed that the ſun's parallax was nearly 8½ ſeconds, and conſequently the diſtance of the ſun from the earth about 24114 of the earth's diameters, or 96 millions of miles. Bradley was ſucceeded, in 1762, in his office of Aſtronomer Royal, by BLISS, Savilian profeſſor of aſtronomy; who being in a declining ſtate of health, did not long enjoy it.

(66.) In 1765, Bliſs was ſucceeded by NEVIL MASKELYNE, the preſent Aſtronomer Royal, who, in January 1761, was ſent by the Royal Society, at a very early age, to the iſland of St Helena, to obſerve the tranſit of Venus over the ſun, and the parallax of the ſtar Sirius. The firſt of theſe objects partly failed, by clouds preventing the ſight of the 2d internal contact; and the 2d alſo, owing to Short having ſuſpended the plumb-line by a loop from the neck of the central pin. However, he indemnified himſelf by many other valuable obſervations: Thus, he obſerved at St Helena, the tides; the horary parallaxes of the moon; and the going of a clock, to find, by compariſon with its previous going which had been obſerved in England, the difference of gravity at the two places; alſo, in going out and returning, he practiſed the method of finding the longitude by the lunar diſtances taken by Hadley's Quadrant, making out rules for the uſe of ſeamen, and teaching the method to the officers on board the ſhip; which was explained in the Philoſophical Tranſactions, for 1762, and more fully afterwards in the Britiſh Mariner's Guide, publiſhed in 1763. In September 1763, he ſailed for the iſland of Barbadoes, to ſettle the longitude of the place, to examine Harriſon's watch, and to try Irwin's marine chair. While at Barbadoes, he made many other obſervations, and amongſt them, many relating to the moon's horary parallaxes, not yet publiſhed.

(67.) MASKELYNE returning to England in the end of 1764, recommended to the Board of Longitude the lunar method of finding the longitude; and propoſed to it the project of a Nautical Almanac, to be calculated and publiſhed to facilitate that method. This the Board agreed to, and the firſt volume was publiſhed for 1767, and has continued ever ſince under his direction, to the great benefit of navigation.

(68.) In conſequence of a propoſal, made by this aſtronomer to the Royal Society, the project was formed of meaſuring accurately the effect of ſome mountain on the plumb-line, in deflecting it from the perpendicular; and SCHEHALLIEN, in Scotland, having been found the moſt convenient in this iſland for the purpoſe, he went into Scotland to conduct the buſineſs; by which experiment he ſhewed, that the ſum of the deflections on the two oppoſite ſides was about 11¾ ſeconds of a degree; and proved, to the ſatisfaction of the whole world, the univerſal attraction of matter. From the data reſulting from theſe meaſures, Dr HUTTON has computed the mean denſity of the whole matter in the earth, to be about 4½ times that of common water.

(69.) The diſcoveries of Dr HERSCHEL form a new æra in aſtronomy. In 1781, he began with obſervations on the periodical ſtar *in Collo Ceti*, and a new method of meaſuring the lunar mountains, none of which he made more than half a mile in height; and, having conſtructed teleſcopes far more powerful than any former ones, proceeded to other obſervations; ſuch as, on the rotation of the planets round their axes; on the parallax of the fixed ſtars; catalogues of double, triple, &c. ſtars; on the proper motion of the ſun and ſolar ſyſtem; on the remarkable appearances of the ſolar regions of the planet Mars, &c. Above all, his diſcoveries of a new primary planet, on the 13th of March 1781, called by him the GEORGIAN PLANET, but named the HERSCHEL, by foreign aſtronomers; and of its two ſatellites, diſcovered ſince that time, has greatly enlarged the bounds of the ſolar ſyſtem, this new planet being more than twice as far from the ſun as the planet Saturn.

(70.) Hiſtorical accounts and liſts of the principal authors and writings on this ſcience, are contained in Weidler's and Bailly's Hiſtory of Aſtronomy. Adam, Voſſius, Bayle, Chanſſepie, Niceron, Perraut, the chronological table of Riccioli, and that of Sherburn, at the end of his edition of Manilius; and the firſt volume of De la Lande's aſtronomy, may alſo be conſulted. The more modern and popular books on aſtronomy are very numerous, and well known; as thoſe of Ferguſon, Long, Emerſon, Vince, De la Lande, Leadbetter, Brent, Keil, Whiſton, Wing, Street, Bonnycaſtle, &c. &c.

PART I.

OF THE APPEARANCES OF THE CELESTIAL BODIES.

SECT. I. *Of the* CELESTIAL BODIES, *as ſeen by the* NAKED EYE.

(71.) THE moſt obvious celeſtial phenomenon is the daily riſing of the SUN in the eaſt, and his ſetting in the weſt; next to which is that of the MOON and STARS appearing, and keeping the ſame weſterly courſe. Theſe cannot be long taken notice of before we muſt perceive that neither the ſun nor moon always riſe exactly in the ſame point of the heavens. If we obſerve the ſun, from the beginning of March, we find that he ſeems to riſe almoſt every day ſenſibly more to the northward, than he did the day before, to continue longer above the horizon, and to be more elevated

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at mid-day, till towards the end of June, when he is observed to move backward in the same manner: this retrograde motion continues beyond the middle of December, when he begins again to move forwards, and so on.

(72.) When the *New* Moon (as she is called, at her early period,) first becomes visible, she appears in the western part of the heavens, at no great distance from the sun. Every night she increases in size, and removes to a greater distance from the sun; till at last she appears in the eastern part of the horizon, just at the time the sun disappears in the western. After this she gradually moves farther and farther eastward, rising every night later and later, till at last she seems to approach the sun as nearly in the east as she did in the west, and rises only a little before him in the morning, as in the first part of her course she set in the west not long after him. All these different appearances are completed in the space of a month; after which they begin in the same order as before.

(73.) Several of the stars neither rise in the E. nor set in the W. but seem to turn round an immoveable point, near which is placed a single star called the POLE, or POLE STAR. This point is more or less elevated according to the different parts of the earth from which we take our view. The inhabitants of Lapland, for instance, see it much more elevated above the horizon than we do; we see it more elevated than the inhabitants of France and Spain; and they, again, see it more elevated than the inhabitants of Barbary. By continually travelling south, this star at last seems depressed in the horizon, and another point appears directly opposite to it, round which the stars in the southern part of the horizon seem to turn. In this part of the heavens, however, there is no star so near the pole as there is in the northern part: nor is the number of stars in the southern part of the heavens so great as in the northern part.

(74.) Supposing us still to travel southward, the north pole entirely disappears, and the whole atmosphere appears to turn round a single point in the south, as the northern hemisphere appears to us to turn round the pole star. The general appearance of the heavens, therefore, is that of a vast concave sphere, turning round two points fixed in the north and south parts of it, once in 24 hours.

(75.) The majority of the stars keep their places with respect to one another; that is, if we observe two stars having a certain apparent distance from each other one night, they seem to have the same every succeeding night. But all the stars in the heavens do not appear to be of this fixed kind: some of them change their places, with regard to the fixed stars, and to one another. Of these, five were only observed formerly; but Herschel has now discovered a sixth. They are distinguished by the appellation of PLANETS, from πλανεω, to wander; and called by the names of *Mercury*, *Venus*, *Mars*, *Jupiter*, *Saturn*, and *Herschel*, or the *Georgium Sidus*. The fixed stars are likewise distinguished from the planets by continually exhibiting that appearance which is called the *scintillation* or *twinkling of the stars*.

(76.) MERCURY is a small star, which emits a very bright white light; but by always keeping near the sun, he is seldom to be seen; and when he does make his appearance, his motion towards the sun is so swift, that he can only be discerned for a short time, a little after sun-set, and again a little before sunrise.

(77.) VENUS, the most beautiful star in the heavens, known by the names of the *morning* and *evening star*, keeps near the sun, though at almost double the distance of Mercury. She is never seen in the eastern quarter of the heavens when the sun is in the western; but seems to attend him in the evening, or to give notice of his approach in the morning.

(78.) MARS is of a red fiery colour, and gives a much duller light than Venus, though sometimes he equals her in size. He is not subject to the same limitation in his motions as Mercury or Venus; but appears sometimes very near the sun, and sometimes at a great distance from him; sometimes rising when the sun sets, or setting when he rises. Of this planet it is remarkable, that when he approaches any of the fixed stars, they change their colour, grow dim, and often become totally invisible, though at some little distance from the body of the planet: but Herschel thinks this has been exaggerated by former astronomers.

(79.) JUPITER and SATURN often appear at great distances from the sun. The former shines with a bright white light, and the latter with a pale faint one; and the motion of Saturn among the fixed stars is so slow, that, unless carefully observed, he will not be thought to move at all. HERSCHEL's motion is still slower, and he is seldom to be seen without a telescope.

(80.) The apparent magnitudes of these bodies are very different at different times. Every person must have observed that Venus is not always equally big; and this apparent difference of magnitude is so remarkable, that she appears no less than 32 times larger at some seasons than at others. This increase of magnitude is likewise very remarkable in Mars and Jupiter, but less so in Saturn, Mercury, and Herschel. These planets by no means appear to us to move regularly in the heavens, but, on the contrary, sometimes go forward, sometimes backward, and sometimes seem to be stationary.

(81.) There are other moving bodies, besides the planets, which appear at uncertain intervals and with a very different aspect. These are very numerous, and no fewer than 450 are supposed to belong to our solar system. They are called COMETS, from κομητης, hairy, having a long tail somewhat resembling the appearance of hair. This, however, is not always the case; for some comets have appeared as round as planets: but in general they have a luminous matter diffused around them, or projecting out from them, which in appearance very much resembles the Aurora Borealis. They appear to come in a direct line towards the sun, as if they were going to fall into his body; and after having disappeared for some time in consequence of their proximity to that luminary, fly off again on the other side as fast as they came, projecting a tail much greater and brighter in their recess; but, getting daily at a farther

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tance from us in the heavens, they continually loſe ſome of their ſplendour, and at laſt totally diſappear.

(82.) The apparent magnitude of comets is very different; ſometimes they appear only of the bigneſs of the fixed ſtars; at other times they equal the diameter of Venus, and ſometimes even of the ſun or moon. In 1652, Hevelius obſerved a comet which ſeemed not inferior to the moon in ſize, though it was not ſo bright, but appeared with a pale and dim light. Theſe bodies alſo ſometimes loſe their ſplendour ſuddenly, while their apparent bulk remains unaltered. With reſpect to their apparent motions, they have all the inequalities of the planets; ſometimes ſeeming to go forwards, ſometimes backwards, and ſometimes to be ſtationary.

(83.) The FIXED STARS are liable to changes: ſeveral obſerved by the ancients are now no more to be ſeen; and new ones have appeared, which were unknown to the ancients. Some of them have alſo diſappeared for ſome time, and again become viſible. At times ſome have been obſerved to diſtinguiſh themſelves by ſuperlative luſtre; but afterwards decreaſing, to vaniſh by degrees, and to be no more ſeen. One of theſe ſtars being firſt ſeen and obſerved by Hipparchus, ſet him upon compoſing a catalogue of the fixed ſtars, that by it poſterity might learn whether any of the ſtars periſh, and others are produced afreſh. After ſeveral ages, Tycho Brahe obſerved another new ſtar which put him on the ſame deſign. Of theſe changes accounts have been given by Halley, and Montanere and Pigot in the Philoſophical Tranſactions. As a ſpecimen of theſe phænomena, we ſhall here inſert an extract from the former,

(84.) "The firſt new ſtar in the chair of Caſſiopeia, was not ſeen by Cornelius Gemma on the 8th of November, 1572, who ſays, he that night conſidered that part of the heavens in a very ſerene ſky, and ſaw it not; but that the next night, November 9, it appeared with a ſplendor ſurpaſſing all the fixed ſtars, and ſcarce leſs bright than Venus. This was not ſeen by Tycho Brahe before the 11th of the ſame month: but from thence he aſſures us that it gradually decreaſed and died away, ſo as in March 1574, after 16 months, to be no longer viſible; and at this day no ſigns of it remain. The place thereof in the ſphere of fixed ſtars, by the accurate obſervations of Tycho, was $0^s\ 9^\circ\ 17'$ *a* 1ma ✱ ♈, with $53^\circ\ 45'$ N. Lat.

(85.) "Such another ſtar was ſeen and obſerved by the ſcholars of Kepler, to begin to appear in Sept. 30. O. S anno 1604, which was not to be ſeen the day before; but it broke out at once with a luſtre ſurpaſſing that of Jupiter; and like the former, it died away gradually, and in much about the ſame time diſappeared totally, there remaining no footſteps thereof in January 1605. This was near the ecliptic, following the right leg of Serpentarius; and by the obſervations of Kepler and others, was in $7^s\ 20^\circ\ 00'$ *a* 1ma ✱ ♐, with north lat $1^\circ\ 56'$. Theſe two ſeem to be a diſtinct ſpecies from the reſt, and nothing like them has appeared ſince.

(86.) "But between them, viz. in 1596, we have the firſt account of the wonderful ſtar in Collo Ceti, ſeen by David Fabricius on the third of Auguſt; as bright as a ſtar of the third magnitude, which has been ſince found to appear and diſappear periodically; its period being preciſely 7 revolutions in ſix years, though it returns not always with the ſame luſtre. Nor is it ever totally extinguiſhed, but may at all times be ſeen with a ſix feet tube. This was ſingular in its kind, till that in Collo Cygni was diſcovered. It precedes the firſt ſtar of Aries $1^\circ\ 40'$, with $15^\circ\ 57'$ ſouth lat.

(87.) "Another new ſtar was firſt diſcovered by William Janſonius in the year 1600, *in pectore*, or rather *in ductione*, Colli Cygni, which exceeded not the third magnitude. This having continued ſome years, became at length ſo ſmall, as to be thought by ſome to have diſappeared entirely: but in the years 1657, 1658, and 1659, it again aroſe to the third magnitude; though ſoon after it decayed by degrees to the fifth or ſixth magnitude, and at this day is to be ſeen as ſuch in $9^s\ 18^\circ\ 38'$ *a* ^{ma} ✱ ♈, with $35^\circ\ 29'$ north lat.

(88.) "A 5th new ſtar was firſt ſeen by Hevelius in 1600, on July 15. O. S. as a ſtar of the third magnitude, but by the beginning of October was ſcarce to be perceived by the naked eye. In April following it was again as bright as before, or rather greater than of the third magnitude, yet wholly diſappeared about the middle of Auguſt. The next year, in March 1672, it was ſeen again, but not exceeding the ſixth magnitude: ſince when, it has been no farther viſible, though we have frequently ſought for its return; its place is $9^s\ 3^\circ\ 17'$ *a* 1ma ✱ ♈, and has lat. north $47^\circ\ 28'$.

(89.) "The ſixth and laſt is that diſcovered by Mr G. Kirch in the year 1686, and its period determined to be of $404\frac{1}{4}$ days; and though it rarely exceeds the fifth magnitude, yet it is very regular in its returns, as we found in the year 1714. Since then we have watched, as the abſence of the moon and clearneſs of the weather would permit, to catch the firſt beginning of its appearance in a ſix feet tube, that, bearing a very great aperture, diſcovers moſt minute ſtars. And on June 15, laſt, it was firſt perceived like one of the very leaſt teleſcopical ſtars: but in the reſt of that month and July, it gradually increaſed, ſo as to become in Auguſt viſible to the naked eye; and ſo continued all the month of September. After that, it again died away by degrees; and on the 8th of December, at night, was ſcarce diſcernible by the tube; and, as near as could be gueſſed, equal to what it was at its firſt appearance on June 25th; ſo that this year it has been ſeen in all near ſix months, which is but little leſs than half its period; and the middle, and conſequently the greateſt brightneſs, falls about the 10th of September."

(90.) The GALAXY or MILKY WAY, is a remarkable appearance in the heavens, being a broad ring of a whitiſh colour, ſurrounding the whole celeſtial concave, whoſe light is now known to proceed from vaſt cluſters of ſtars, diſcoverable only by the teleſcope. Mr Brydone, in his journey to the top of Mount Ætna, found this phænomenon to make a glorious appearance, "like a pure flame, (as he expreſſes it) that ſhot acroſs the heavens."

(91.) The only other appearances, which are

very observable by the unassisted eye, are those obscurations of the sun and moon, commonly called ECLIPSES. These are too well known, and attract the attention too much, to need any particular description. We have, however, accounts very well authenticated, of obscurations of the sun continuing for a much longer time than a common eclipse possibly can do, and likewise of the darkness being much greater than usual on such occasions.

SECT. II. *Of the* CELESTIAL BODIES *as seen through* TELESCOPES.

(92.) Although the sun, to the naked eye, is extremely bright and splendid, he is frequently observed, even through a telescope of but very small powers, to have dark spots on his surface, which are said to have been first discovered in 1611; and the honour of the discovery is disputed betwixt Galileo and Scheiner, a German Jesuit at Ingolstadt. But whatever merit Scheiner might have in the priority of the discovery, it is certain, that Galileo far exceeded him in accuracy; though Scheiner's work has considerable merit, as containing observations selected from above 3000 made by himself.

(93.) It appears from the papers of HARRIOT, the English algebraist, which were found in 1784, at the seat of the Earl of Egremont in Sussex, that he made a great number of observations upon the solar spots, much about the same time; and Dr ZACH, astronomer to the Duke of Saxe Gotha, in an account of Harriot's papers, published in 1788, says, that there is the greatest probability of Harriot being the first discoverer of these spots, even before either Galileo or Scheiner. For Galileo's first produced observations are only for June 2, 1612, and those of Scheiner of the month of October in the same year, whereas Harriot's are of Dec. 8, 1610, as appears from his MSS.

(94.) There is great variety in the magnitudes of the solar spots; the difference is chiefly in superficial extent of length and breadth; their depth or thickness is very small: some have been so large, as by computation to be capable of covering the continents of Asia and Africa; nay, the whole surface of the earth, or even five times its surface. The diameter of a spot, when near the middle of the disk, is measured by comparing the time it takes in passing over a cross hair in a telescope, with the time wherein the whole disk of the sun passes over the same hair; it may also be measured by the micrometer; and, by either of these methods, we may judge how many times the diameter of the spot is contained in the diameter of the sun.

(95.) Spots are subject to increase and diminution of magnitude, and seldom continue long in the same state. They are of various shapes; most of them having a deep black nucleus surrounded by a dusky cloud, whereof the inner parts near the black are a little brighter than the outskirts. They change their shapes, something in the manner that our clouds do; though not often so suddenly: thus what is of a certain figure to day, shall, to-morrow, or perhaps in a few hours, be of a different one; what is now but one spot, shall, in a little time be broken into two or three, and sometimes two or three spots shall coalesce and be united into one. The number of spots on the sun is very uncertain; sometimes there a great many, sometimes very few; and sometimes none at all.

(96.) SCHEINER made observations on the sun from 1611 to 1629; and says he never found the disk quite free of spots, excepting a few days in December 1624. At other times he frequently saw 20, 30, and in the year 1625 he was able to count 50 spots on the sun at a time. In an interval afterwards of 20 years, from 1650 to 1670, scarcely any spots were to be seen, and since that time some years have furnished a great number of spots, and others none at all; but since the beginning of the last century, not a year passes wherein some were not seen.

(97.) It is evident from the various appearances that the spots are not endowed with any permanency, nor at all regular in their shape, magnitude, number, or time of appearance or continuance. Hevelius observed one that arose and vanished in 16 or 17 hours; and no one has been observed to continue longer than 70 days: those spots that are formed gradually, are gradually dissolved; while those that arise suddenly, are for the most part suddenly dissolved. When a spot disappears, that part where it was generally becomes brighter than the rest of the sun, and continues so for several days; on the other hand, those bright parts called *faculæ* (as the others called *maculæ*) sometimes turn to spots.

(98.) The solar spots appear to have a motion across the sun's disk. Every spot, if it continues long enough without being dissolved, appears to enter the sun's disk on the east side, to go from thence with the velocity continually increasing till it has gone half way; and then to move slower and slower, till it goes off at the west side: after which it disappears for about the same space of time that it spent in crossing the disk, and then enters upon the east side again, nearly in the same place, and crosses it in the same track, and with the same unequal motion as before. The motion of the spots is in the order of the signs (the same way that all motions in the solar system, those of the comets alone excepted, are performed); and therefore, as the earth revolves round the sun the same way with the solar spots, one of these will appear to remain longer on the disk than it would otherwise do if the earth remained at rest.

(99.) The face of the sun, when clear of spots, as seen by the naked eye through a smoked or coloured glass, or through a thin cloud, or the vapours near the horizon, appears all over equally luminous: but when viewed through the telescope, the glasses being smoked or coloured, the middle of the disk appears brighter than the outskirts; because the light is darted more directly towards us from the middle than from any other part, and the faculæ appear more distinctly on the sides, as being on a darker ground than in the middle.

(100.) All the phænomena of the solar spots delivered by Scheiner and Hevelius, may be summed up in the following particulars. 1. Every spot which hath a nucleus, or considerably dark

t, hath also an *umbra*, or fainter shade, surrounding it. 2. The boundary betwixt the nucleus and umbra is always distinct and well defined. 3. The increase of a spot is gradual, the breadth of the nucleus and umbra dilating at the same time. 4. In like manner, the decrease of a spot is gradual; the breadth of the nucleus and umbra contracting at the same time. 5. The exterior boundary of the umbra never consists of sharp angles; but is always curvilinear, however irregular soever the outline of the nucleus may be. 6. The nucleus of a spot, whilst on the decrease, often changes its figure by the umbra encroaching irregularly upon it, insomuch that in a small space of time new encroachments are discernible, whereby the boundary betwixt the nucleus and umbra is perpetually varying. 7. It often happens, by these encroachments, that the nucleus of a spot is divided into two or more nuclei. 8. The nuclei of the spots vanish sooner than the umbræ. 9. Small umbræ are often seen without nuclei. 10. An umbra of considerable size is seldom seen without a nucleus in the middle of it. 11. When a spot which consists of a nucleus and umbra is about to disappear, if it is not succeeded by a *facula*, or spot brighter than the rest of the disk, the place where the spot was is soon after not distinguishable from the rest. (101.) Dr Wilson, in the Phil. Trans. vol. lxiv. mentions the following appearances. 1. When a spot is about to disapear on the western edge of the sun's limb, the eastern part of the umbra first disappears, then vanishes, the nucleus and western part of the umbra remaining; then the nucleus gradually contracts and vanishes, while the western part of the umbra remains. At last this disappears also; and if the spot remains long enough to become again visible, the eastern part of the umbra first becomes visible, then the nucleus; and when the spot approaches the middle of the disk, the nucleus appears environed by the umbra on both sides, as already mentioned. 2. When two spots lie very near to one another, the umbra is sufficient on that side which lies next the other spot; and this will be the case, though a large spot should be contiguous to one much smaller; the umbra of the large spot will be totally wanting on that side next the small one. If there are three spots on each side of the large one, the umbra does not totally vanish; but appears flattened or pressed in towards the nucleus on each side. When the little spots disappear, the umbra of the large one extends itself as usual. This circumstance, he observes, may sometimes prevent the disappearance of the umbra in the manner above mentioned; so that the western umbra may disappear before the nucleus, if a small spot happens to break out on that side.

(102.) Mr Wollaston observes in the same volume, p. 337, that the appearances mentioned by Wilson are not constant: and as much depends upon the accuracy of observers and the situation of the spots on the sun's orb, it is probable that the revolution will continue to differ in minute particulars, till a consistent theory is formed, by which the cause of these phænomena may be examined.

(103.) The spots are not confined to one part of the sun's disk; though we have not heard of any being observed about his polar regions. The paths they describe in their course over the disk are exceedingly different; sometimes being straight lines, sometimes curves, sometimes descending from the northern to the southern parts of the disk, sometimes ascending from the southern to the northern, &c. Besides these spots, there are others which sometimes appear very round and black, travelling over the disk of the sun in a few hours, totally unlike the others, and proceeding from an interposition of the planets Mercury and Venus between the earth and the sun. Excepting the two kinds of spots above mentioned, however, no kind of object is discoverable on the surface of the sun, but he appears like an immense ocean of elementary fire or light.

(104.) The appearance of the Moon is very different. Many darkish spots appear in her to the naked eye; and through a telescope their number is prodigiously increased: the disk appears very plainly to be more protuberant in the middle than at the edges, or to have the figure of a globe, and not a flat circle. When the moon is gibbous or horned, the one side appears very ragged and uneven, but the other always exactly defined and circular. The spots in the moon always keep their places exactly; never vanishing, or going from one side to the other, as those of the sun do. We sometimes see more or less of the northern and southern, and eastern and western part of the disk or face; which is owing to what is called her libration.

(105.) Plate XXVIII, Fig. 1. gives a representation of the full moon in her mean libration, with the numbers to the principal spots according to Riccioli, Cassini, and Mayer; underneath which the figure of part of the moon's surface is more accurately delineated. The names are as follow:

1 Grimaldus.	27 Posidonius.
2 Galileus.	28 Dionysius.
3 Aristarchus.	29 Plinius.
4 Keplerus.	30 Catharina Cyrillus. Theophilus.
5 Gassendus.	
6 Shikardus.	31 Fracastorius.
7 Harpalus.	32 Promontorium acutum. Censorinus.
8 Heraclides.	
9 Lansbergius.	33 Messala.
10 Reinoldus.	34 Promontorium Somnii.
11 Copernicus.	35 Proclus.
12 Helicon.	36 Cleomedes.
13 Capuanus.	37 Snellius et Furnerius.
14 Bullialdus.	38 Petavius.
15 Eratosthenes.	39 Langrenus.
16 Timocharis.	40 Taruntius.
17 Plato.	41 Herschell's Volcano.
18 Archimedes.	*A* Mare Humorum.
19 Insula Sinus Medii.	*B* Mare Nubium.
20 Pitatus.	*C* Mare Imbrium.
21 Tycho.	*D* Mare Nectaris.
22 Eudoxus.	*E* Mare Tranquillitatis.
23 Aristoteles.	*F* Mare Serenitatis.
24 Manilius.	*G* Mare Fecunditatis.
25 Menelaus.	*H* Mare Crisium.
26 Hermes.	

(106.) Mercury, when looked at through telescopes magnifying about 200 or 300 times, appears equally luminous throughout his whole sur-

face, without the leaſt dark ſpot. He appears to have the ſame phaſes with the moon, being ſometimes horned, ſometimes gibbous, and ſometimes ſhinning almoſt with a round face, though not entirely full, becauſe his enlightened ſide is never turned directly towards us; but at all times perfectly well defined without any ragged edge, and perfectly bright.

(107.) VENUS, when viewed through a teleſcope, is rarely ſeen to ſhine with a full face, but has phaſes and changes like thoſe of the moon, by increaſing, decreaſing, being horned, gibbous, &c. Her illuminated part is conſtantly turned toward the ſun; being directed toward the eaſt when ſhe is a morning ſtar, and toward the weſt when an evening ſtar. Her different phaſes were firſt diſcovered by Galileo. Dr HERSCHEL has publiſhed, in the Phil. Tranſ. for 1793, a long ſeries of obſervations on this planet, from which he concludes; 1. that the planet revolves about its axis, but that the period, and the poſition of the axis are uncertain; 2. that the planet's atmoſphere is very conſiderable; 3. that there are probably hills and inequalities upon its ſurface, though he has not been able to ſee much of them, owing, perhaps, to the denſity of its atmoſphere; and, 4. that this planet is ſomewhat larger than the earth, inſtead of being leſs, as former aſtronomers have imagined.

(108.) Much larger and more remarkable ſpots have been perceived on the diſk of MARS, than on that of any other primary planet. By very accurate obſervations Herſchel has determined the proportion between the polar and equatorial diameters, and the length of the day in this planet. He has alſo given ſome good conjectures on its ſeaſons and its atmoſphere: the latter it is now aſcertained to have; but though conſiderable, the atmoſphere is not of ſo great an extent as the conjectures on former obſervations led aſtronomers to imagine.

(109.) JUPITER has the ſame general appearance with Mars, only that the belts on his ſurface are much larger and more permanent. Their number is very variable, as ſometimes only one, and at other times no fewer than 8, may be perceived. They are generally parallel to one another but not always ſo; and their breadth is likewiſe variable, one belt having been obſerved to grow narrow, while another in its neighbourhood has increaſed in breadth, as if the one had flowed into the other. The time of their continuance is very uncertain, ſometimes remaining unchanged for three months; at others, new belts have been formed in an hour or two. In ſome of theſe belts large black ſpots have appeared, which moved ſwiftly over the diſk from eaſt to weſt, and returned in a ſhort time to the ſame place; from whence the rotation of this planet about its axis has been determined.

(110.) The figure of Jupiter is evidently an oblate ſpheroid, the longeſt diameter of his diſk being to the ſhorteſt as 13 to 12. His rotation is from weſt to eaſt, like that of the ſun, and the plane of his equator is very nearly coincident with that of his orbit; ſo that there can ſcarce be any difference of ſeaſons in that planet. His rotation has been obſerved to be ſomewhat ſwifter in aphelion than his perihelion.

(111.) The moſt remarkable circumſtance attending this planet is his having four SATELLITES, which conſtantly revolve round him at different diſtances. Theſe are all found to move in ellipſes; though the eccentricities of them are too ſmall to be meaſured, except that of the fourth; and even this ſcarce differs more than 0.07 of its mean diſtance from the primary.

(112.) The periodic times and diſtances of the ſatellites, in ſemidiameters of Jupiter, and alſo in Engliſh miles, the angles under which their orbits appear, as ſeen from the earth, and their diſtance from Jupiter, taken from the moſt exact obſervations, are as follow.

N°	Periodic times.				Diſtances from Jupiter's centre.	
					Semi-diam.	Miles
1	1d.	18h.	27′	34″	5 5/12	266,000
2	3	13	13	42	9 1/12	423,000
3	7	3	42	36	14 7/12	676,000
4	16	16	32	9	25 1/12	1,189,000

(113.) The nodes of theſe ſatellites keep the ſame place. All of them, by reaſon of their immenſe diſtance, ſeem to keep near the ecliptic, and their apparent motion is a kind of libration like that of a pendulum, going from their greateſt diſtance on one ſide to the greateſt diſtance on the other, ſometimes in a ſtraight line, and ſometimes in an ellipſe. When a ſatellite is in its ſuperior ſemicircle, or that half of its orbit which is more diſtant from the earth than Jupiter is, its motion appears to us direct, according to the order of the ſigns; but in its inferior ſemicircle, when it is nearer to us than Jupiter, its motion appears retrograde; and both theſe motions ſeem quickeſt when the ſatellites are to the centre of the planet; the ſlower the more diſtant they are, and at their greateſt diſtance of all they appear for a ſhort time to be ſtationary.

(114.) It is evident, from this account of the ſyſtem of Jupiter and his ſatellites, that occultations of them muſt frequently happen by their going behind their primary, or by coming betwixt us and it. The former takes place when they proceed towards the middle of the inferior ſemicirle; the latter when they paſs through the ſame part of their inferior ſemicircle. Occultations of the former kind happen to the firſt and third ſatellite; at every revolution, the third conſtantly eſcapes an occultation, but the firſt is more frequently by reaſon of its greater diſtance. It is ſeldom that a ſatellite can be diſcovered upon the diſk of Jupiter, even by the beſt teleſcopes, except during its firſt entrance, when, by reaſon of its being more directly illuminated by the rays of the ſun than the planet itſelf, it appears like a bright ſpot upon it. Sometimes, however, a ſatellite, in paſſing over the diſk, appears like a dark ſpot, and is eaſily to be diſtinguiſhed. This is ſuppoſed to be owing to ſpots on the body of the primary planets; and it is remarkable, that

Fig. 1.

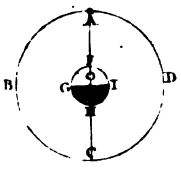
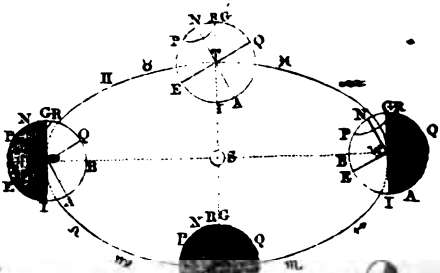


Fig. 2.



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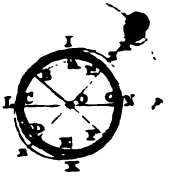

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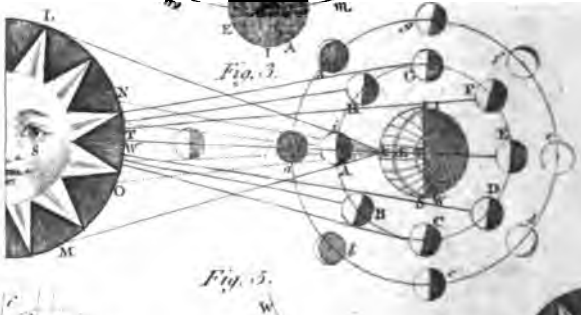

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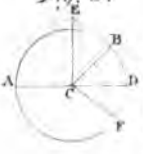
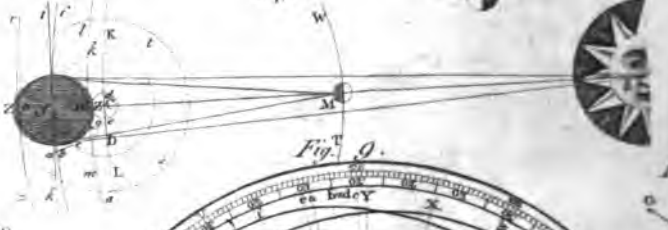


Fig. 11.

Fig. 5.



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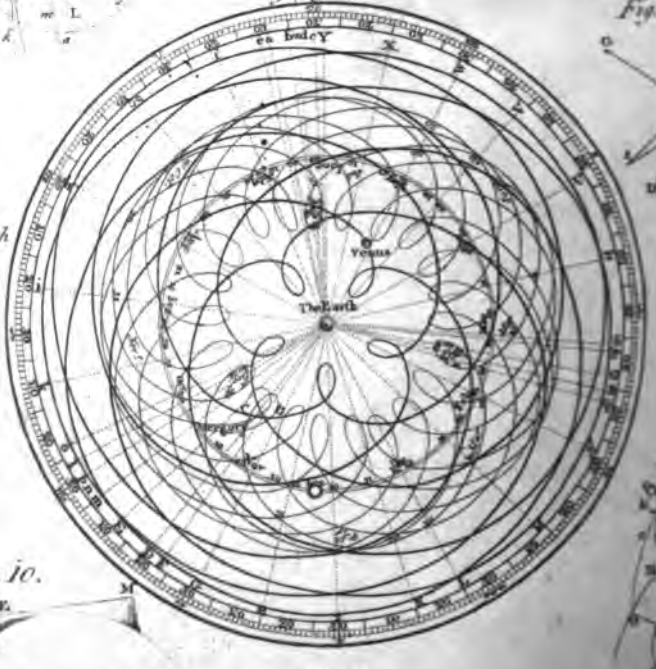


Fig. 7

Fig. 8.

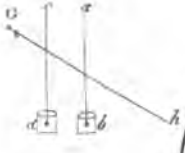
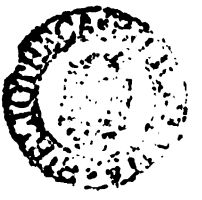


Fig. 10.

Fig. 12

Fig. 13.



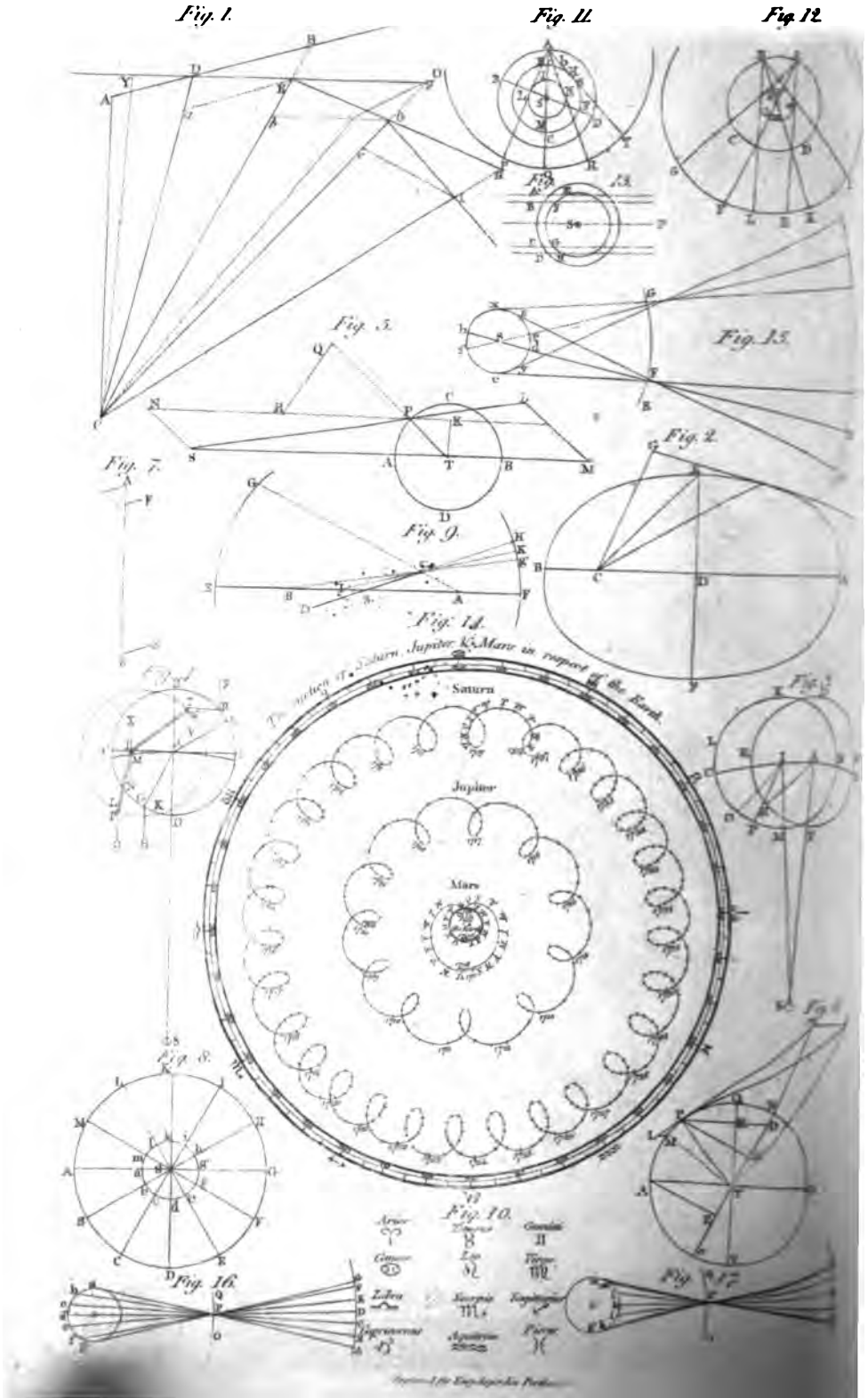


Fig. 1.
Fig. 11.
Fig. 12.
Fig. 13.
Fig. 3.
Fig. 15.
Fig. 7.
Fig. 2.
Fig. 9.
Fig. 14.
The motion of Saturn, Jupiter & Mars in respect of the Earth.
Saturn
Jupiter
Mars
Fig. 5.
Fig. 8.
Fig. 4.
Fig. 10.
Aries
Taurus
Gemini
Cancer
Leo
Virgo
Libra
Scorpio
Sagittarius
Capricornus
Aquarius
Pisces
Fig. 16.
Fig. 17.

BIBLIOTHECA BODLEIANA

Fig. 4.

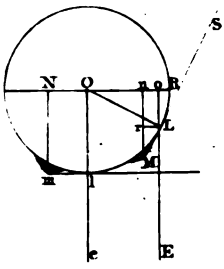


Fig. 1.

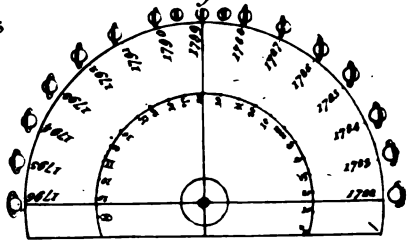
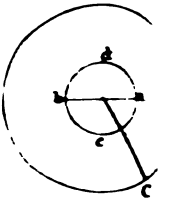


Fig. 2.



Jupiter and his Satellites.

Saturn and his Satellites.

Earth Moon

Distance of the Moon from the Earth

Distance of the 4th Satellite from the 3d

Mercury
Venus
Mars
Jupiter
Saturn

Fig. 8.
Ptolemaic System.

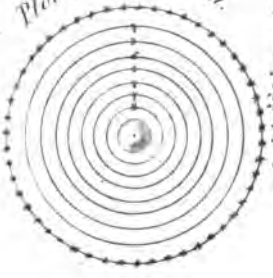


Fig. 6.

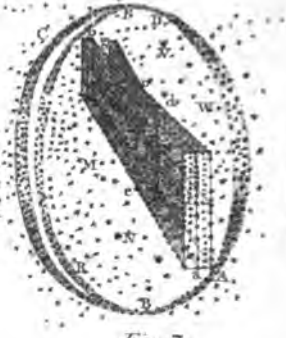


Fig. 9.
Tychonic System.

Fig. 3.

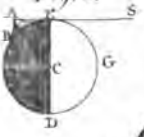


Fig. 7.

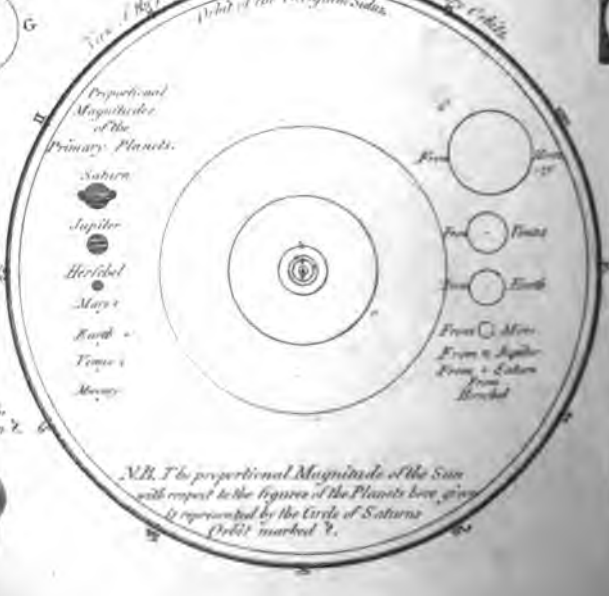


Fig. A.

Fig. 5.

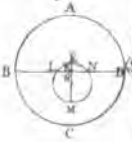


Fig. 10

Fig. B.
Saturn ♄

Fig. C.

tellite has been known to pass over the disk at ne time as a dark spot, and at another so lumi- ous that it could not be distinguished from Ju- ter himself, except at its coming on and going ff.

(115.) To account for this phænomenon, we ust say th t either the spots are subject to change; , if they be permanent like those of our moon, at the satellites at different times turn different arts of their globes towards us. Possibly both ese causes may contribute to produce the phæ- omena just mentioned. For these reasons also oth the light and apparent magnitude of the sa- llites are variable: for the fewer spots there e upon that side which is turned towards us, ne brighter it will appear; and as the bright side nly can be seen, a satellite must appear larger ne more of its bright side it turns towards the arth, and the less so the more it happens to be overed with spots. The fourth satellite, though enerally the smallest, sometimes appears bigger han any of the rest: the third sometimes seems east, though usually the largest; nay, a satellite nay be so covered with spots as to appear less han its shadow passing over the disk of the pri- ary, though we are certain that the shadow nust be smaller than the body which casts it.— To a spectator placed on the surface of Jupiter, ach of these satellites would put on the various ip earances of the moon; but they appear to us always round, having constantly their enlightened alf turned towards the earth.

(116.) When these moons pass through their in- ferior s micircles, they cast a shadow upon Jupi- ter and thus cause an eclipse of the sun to his in- habitants; and in some situations this shadow may be observed going before or following the satellite. On the other hand, in passing through their su- perior semicircles, the satellites may be eclipsed in the same manner as our moon is to us, by pas- sing through the shadow of Jupiter; and this is actually the case with the first, second, and third of these bodies; but the fourth, by reason of the largeness of its orbit, passes sometimes above or below the shadow, as is the case with our moon. The beginnings and endings of these eclipses are easily seen by a telescope when the earth is in a proper situation with regard to Jupiter and the sun; but when this or any other planet is in con- junction with the sun, the superior brightness of that luminary renders both it and the satellites in- visible. From the time of its first appearing after a conjunction until near the opposition, only the immersions of the satellites into his shadow, or the beginnings of the eclipses are visible; at the opposition, only the occultations of the satellites, by going behind or coming before their primary, are observable; and from the opposition to the conjunction, only the immersions, or end of the eclipses are to be seen.

(117.) This is exactly true in the first satellite, of which we can never see an immersion with its immediately subsequent emersion: and it is but rarely that they can be both seen in the second; as in order to their being so, that satellite must be near one of its limits, at the same time that the planet is near its perihelion and quadrature with the sun. With regard to the third, when Jupiter is more than 46° from conjunction with, or op- position to, the sun, both its immersions and im- mediately subsequent emersions are visible; as they likewise are in the fourth, when the distance of Jupiter from conjunction or opposition is 24°.

(118.) When Jupiter is in quadrature with the sun, the earth is farthest out of the line that pas- ses through the centres of the sun and Jupiter, and therefore the shadow of the planet is then most exposed to our view: but even then the bo- dy of the planet will hide from us one side of that part of the shadow which is nearest to it, through which the first satellite passes; which is the reason that, though we see the entrance of that satellite into the shadow, or its coming out from thence, as the earth is situate on the east or west side thereof, we cannot see them both; whereas the other satellites going through the shadow at a greater distance from Jupiter, their ingress and egress are both visible. The relative distances of these moons from their primary, are shewn in Plate XV. fig. 11.

(119.) SATURN, when viewed through a good telescope, makes a more remarkable appearance than any of the other planets. Galileo first dis- covered his uncommon shape, and from the dis- coveries made by him and other astronomers, it appears that this planet is surrounded by a broad thin ring, the edge of which reflects little or none of the sun's light to us, but the planes of the ring reflect the light in the same manner that the pla- net itself does; and if we suppose the diameter of Saturn to be divided into 3 equal parts, the dia- meter of the ring is about 7 of these parts. The ring is detached from the body of Saturn in such a manner, that the distance between the inner- most part of the ring and the body is equal to its breadth. If we had a view of the planet and his ring with our eyes perpendicular to one of the planes of the latter, we should see them as in Plate XV. fig. A.; but our eye is never so much elevated above either plane as to have the visual ray stand at right angles to it, nor indeed is it ever elevated more than about 30° above it; so that the ring being commonly viewed at an oblique angle, appears of an oval form, and though very good telescopes double, as represented Plate XV. fig. 11. and fig. B.

(120.) Both the outward and inward rim are projected into an ellipses, more or less oblong ac- cording to the different degrees of obliquity with which it is viewed. Sometimes our eye is in the plane of the ring, and then it becomes invisible; either because the outward edge is not fitted to reflect the sun's light, or more probably because it is too thin to be seen at such a distance. As the plane of this ring keeps always parallel to itself, that is, its situation in one part of the orbit is al- ways parallel to that in any other part, it disap- pears twice in every evolution of the planet, that is about once in 15 years; and he sometimes ap- pears quite round for months together. At other times, the distance betwixt the body of the planet and the ring is very perceptible; and Mr Whiston tells us, th t Dr Clarke's father saw a star through the opening.

(121.) When Saturn appears round, if our eye be in the plane of the ring, it will appear as

as a dark line acroſs the middle of the planet's diſk; and if our eye be elevated above the plane of the ring, a ſhadowy belt will be viſible, cauſed by the ſhadow of the ring as well as by the interpoſition of part of it betwixt the eye and the planet. The ſhadow of the ring is broadeſt when the ſun is moſt elevated, but its obſcure parts appear broadeſt when our eye is moſt elevated above the plane of it. When it appears double, the ring next the body of the planet, appears brighteſt; when the ring appears of an elliptical form, the parts about the ends of the largeſt axis are called the *anſæ*. Theſe, a little before and after the diſappearing of the ring, are of unequal magnitude: the largeſt anſa is longer viſible before the planet's round phaſe, and appears again ſooner than the other. In the diagram, Plate XV. fig. 1. are delineated the phaſes of the ring from its full appearance in 1782 to its diſappearance in 1789, and its full re-appearance in 1796.

(122.) Dr HERSCHEL has found that the ring is double or that there are two concentric rings; alſo that it has a motion of rotation in its own plane, its axis of motion being the ſame as that of Saturn himſelf; and its periodical time 10*h* 32′ 15,″4: But he thinks it probable that the concentric rings may not revolve in the ſame period.—Their dimenſions, and the ſpace between them, he ſtates in the following proportion to each other:

	miles.
Inner diameter of the ſame Ring	146345
Outſide diam. of ditto	184393
Inner diam. of the larger Ring	190248
Outſide diam. of ditto	204883
Breadth of the Ring	20000
Breadth of the outer ditto	7200
Breadth of the vacant ſpace	2839

(123.) Dr Herſchel concludes, from his obſervations on the Ring, that its ſtructure is ſuch, as to allow it to remain permanently in its preſent ſtate; nor does he think it at all probable that the ring is of that changeable nature which ſome perſons have imagined.

(124.) The ſame excellent aſtronomer from a ſeries of obſervations on the belts of Saturn has concluded that he revolves upon his axis in 10*h* 16′ 0,″4, that he has a denſe atmoſphere, and that his polar diameter is to his equatorial one as 10 to 11.

(125.) Saturn has beſides his ring ſeven little ſecondary planets or ſatellites revolving round him. One of them, which till lately was reckoned the 4th in order from Saturn, was diſcovered by Huygens in 1655 by means of a teleſcope 100 feet long; and the others, viz. the 1ſt, 2d, 3d, and 5th, at different times by Caſſini, between 1671 and 1684, by the help of glaſſes of 100 and 136 feet. The 6th and 7th have lately been diſcovered by Herſchel with his 40 feet reflecting teleſcope in 1787 and 1788. Theſe he has called the 6th and 7th ſatellites, though they are nearer to Saturn than the other 5; that the names may not be miſtaken with regard to former obſervations of them.

(126.) The periodical revolutions and diſtances of theſe ſatellites expreſſed in ſemidiameters of that planet, and in Engliſh miles are as follow:

No.	Periodic times				Diſtances in Semidiam.	Diſtances in Miles.	Apparent Diſtance
1	1*d*	21*h*	18′	27″	4	170,000	1 :
2	2	17	41	22	5	217,000	1
3	4	12	25	12	8	303,000	1
4	15	22	41	13	18	704,000	1
5	79	7	48	0	54	2,050,000	1
6	1	8	53	9	3	135,000	1
7	0	22	40	46	2	107,000	1

(127.) The four firſt deſcribe ellipſes [illegible] of the ring and are in the ſame plane: the [illegible] nation to the orbit is from 30° to 31°. The [illegible] deſcribes an orbit inclined from 17° to 18° [illegible] orbit of Saturn, his plane lying between [illegible] tic and thoſe of the other ſatellites. Dr [illegible] obſerves that the 5th ſatellite turns round [illegible] once, exactly in the time in which it [illegible] round the planet Saturn. In this reſpect it [illegible] bles our moon, which does the ſame. The proportional diſtances of the 5 ſatellites [illegible] known to aſtronomers are ſhewn in Plate [illegible] 11.

(128.) The GEORGIUM SIDUS or HERSCHEL being more remote than Saturn, is alſo leſs [illegible] Its apparent magnitude is ſo ſmall, that it [illegible] ſeldom be ſeen by the naked eye, and even [illegible] viewed by means of the teleſcope, it appears [illegible] a few ſeconds in diameter. This planet was [illegible] covered by Dr Herſchel in 1781; and in [illegible] likewiſe diſcovered two ſatellites that [illegible] round it. They are probably not leſs than [illegible] ter's moons, and their orbits are nearly perpendicular to the ecliptic. This is a circumſtance [illegible] which they differ from the attendants of [illegible] other planets.

(129.) Their periods of revolution and [illegible] diſtances from their primary are as follow:

Satellite.	Periods.				Diſt.	
1*ſt.*	8*d.*	17*h.*	1′	19″	0′	3″
2*d.*	13	11	5	1	0	4

(130.) The COMETS, viewed through a teleſcope, have a very different appearance from [illegible] of the planets. The nucleus, or ſtar, ſeems [illegible] dimmer. They are to appearance [illegible] with atmoſpheres of a prodigious ſize, [illegible] ſing ten times higher than the nucleus, [illegible] often likewiſe different phaſes, like the moon.

(131. The head of a comet, ſeen through a good teleſcope, appears to conſiſt of a nucleus and an atmoſphere, that ſurrounds it. This part is frequently called the *envelope*: it, through a teleſcope, is eaſily diſtinguiſhed from the atmoſphere or hairy appearance.

(132.) A comet is generally attended with a *blaze* or *tail*, whereby it is diſtinguiſhed from a ſtar or planet; as it is alſo by its motion. Sometimes the tail only of a comet has been ſeen,

Fig. 1. The Moon in her mean libration, with the Spots, according to Riccioli, Cassini, &c.

Fig. 6.

Fig. 7.

Fig. 9.

Path & appearances of the Comet of 1680, whose period is 575 yrs.

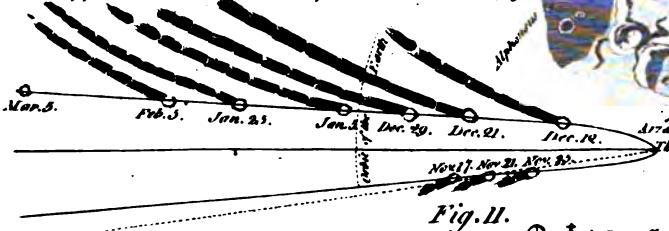


Fig. 11.

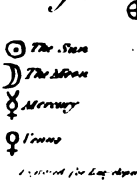


Fig. 8.

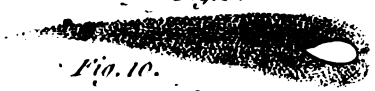


Fig. 10.

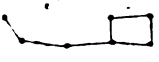


Fig. 2. Part of the Moon from Russell.

Fig. 4.

Fig. 5.

Fig. 12.

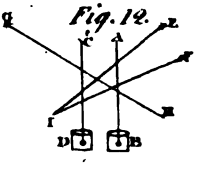


Fig. 13.

ace where the head has been all the while un-
the horizon; ſuch an appearance is called a
n. As the tail of a comet is owing to the
of the ſun, it grows larger as the comet ap-
aches near to, and ſhortens as it recedes from,
luminary.

133.) If the tail of a comet were to continue
the ſame length, it would appear longer or
rter, according to the different views of the
tator; for if his eye be in a line, drawn thro'
middle of the tail lengthwiſe, or nearly ſo,
tail will not be diſtinguiſhed from the reſt of
atmoſphere, but the whole will appear round;
he eye be a little out of that line, the tail will
ear ſhort (ſee Plate XV. Fig. C.); and it is
led a *bearded comet*, when the tail hangs down
ards the horizon, as in that figure. If the
of a comet be viewed ſidewiſe, the whole
gth of it is ſeen. It is obvious, that the near-
the eye is to the tail, the greater will be its
parent length.

134.) The tails of comets often appear bent,
e Plate XXVIII. Fig. 8, 9.), owing to the reſiſt-
e of the æther; which, though extremely
il, may have a ſenſible effect on ſo thin a va-
ur as the tail conſiſts of. This bending is ſeen
y when the earth is not in the plane of the or-
of the comet continued. When that plane
ſes through the eye of the ſpectator, the tail
pears ſtraight. See Plate XXVIII. Fig. 6, 7.

135.) The FIXED STARS, when viewed thro'
e beſt teleſcopes, appear not in the leaſt magni-
d, but rather diminiſhed, on account, as is
ought by ſome, that the teleſcope takes off that
inkling appearance they make to the naked
e; but by others more probably, that the tele-
ope tube excludes a quantity of the rays of
ht, which are not only emitted from the parti-
ar ſtars themſelves, but by many thouſands
ore, which falling upon our eyelids and the ae-
al particles about us, are reflected into our eyes
ſtrongly as to excite vibrations, not only on
ſo- points of the retina where the images of the
ars are formed, but alſo in other points at the
me diſtance round about. This without the
leſcope makes us imagine the ſtars to be much
igger than when we ſee them only by a few rays
oming directly from them, ſo as to enter our eye
thout being intermixed with others.

136.) The NUMBER of ſtars appears prodigi-
uſly increaſed through the teleſcope; 70 ſtars
ave been counted in the conſtellation called *Plei-
des*, and no fewer than 2000 in that of Orion.
he late improvements of Herſchel, however,
ave ſhown the number of ſtars to be exceeding-
y beyond even what the diſcoveries of former a-
tronomers would induce us to ſuppoſe. He has
lſo ſhown, that many, which, to the eye, or
hrough ordinary glaſſes, appear ſingle, do in
act conſiſt of two or more ſtars; and that the
Galaxy or Milky Way owes its light entirely to
multitudes of ſmall ſtars placed ſo cloſe, that the
naked eye, or even ordinary teleſcopes, cannot
diſtinguiſh them.

137.) The NEBULÆ, or ſmall whitiſh ſpecks,
diſcoverable by teleſcopes in various parts of the
heavens, are owing to the ſame cauſe. Former
aſtronomers could only reckon 103; but Herſchel
has diſcovered upwards of 1250. He has alſo diſ-
covered a ſpecies of them, which he calls *planeta-
ry nebulæ*, on account of their brightneſs, and
ſhining with a well-defined diſk.

SECT. III. CONCLUSIONS *drawn from the* APPEARANCE *of the* SUN *and* PLANETS.

(138.) Various conjectures have been formed
on the nature of the celeſtial bodies. ANAXI-
MANDER and ANAXIMENES held, that there was
a circle of fire all along the heavens, which they
called *the circle of the ſun*; between the earth and
this fiery circle was placed another circle of ſome
opaque matter, in which there was a hole like the
mouth of a German flute! Through this hole
the light was tranſmitted, and appeared to the
inhabitants of this earth as a round and diſtinct
body of fire, and the eclipſes of the ſun were
ſuppoſed to be occaſioned by ſtopping this hole!

(139.) ANAXAGORAS held the ſun to be a fiery
globe of ſome ſolid ſubſtance, bigger than Pelo-
ponneſus; and many of the moderns have adopt-
ed this notion, only increaſing the magnitude of
the globe prodigiouſly. Sir ISSAC NEWTON has
propoſed it as a query; Whether the ſun and fix-
ed ſtars are not great *Earths* made vehemently
hot, whoſe parts are kept from fuming away, by
the vaſt weight and denſity of their ſuperincum-
bent atmoſpheres, and whoſe heat is preſerved by
the prodigious action and re-action of their parts
upon one another? But, though he has propoſed
this as a query, and taken the exiſtence of a ſolar
atmoſphere for granted, there have yet been no
proofs adduced in favour of that opinion beſides
thoſe of analogy and probability.

(140.) There is, however, an appearance in the
heavens, termed *lemita luminoſa*, or the ZODIA-
CAL LIGHT, which is now generally ſuppoſed to
be owing to the ſun's atmoſphere. This was firſt
diſcovered by Caſſini, in 1683. It is ſomething
like the Milky Way, a faint twilight, or the tail
of a comet, thin enough to let ſtars be ſeen thro'
it, and ſeems to ſurround the ſun, in the form of
a lens, the plane whereof is nearly co-incident
with that of the ſun's equator. It is ſeen ſtretch-
ed along the zodiac, and accompanies the ſun in
his annual motion through the 12 ſigns. Each
end terminates in an angle of about 14°; the ex-
tent of it in length from either of the angular
points varies from 50 to 100°; it reaches beyond
the orbit of Venus, but not ſo far as that of the
Earth. The breadth of it near the horizon is al-
ſo various; from 12° almoſt to 30°; near the ſun,
where it may reaſonably be ſuppoſed to be broad-
eſt, it cannot be ſeen.

(141.) This light is weakeſt in the morning,
and ſtrongeſt at night; diſappearing in full moon-
light, or in ſtrong twilight, and therefore, is not
at all viſible about midſummer, in places ſo near
either of the poles as to have their twilight all the
night, but may be ſeen in thoſe places, in the
middle of winter, both morning and evening, as
it may in places under and near the equator, all
the year round. In north latitude, it is moſt con-
ſpicuous after the evening twilight, about the lat-
ter end of February, and before the morning twi-
light, in the beginning of October; [illegible]
times, it ſtands moſt erect above the

is therefore cleareſt from the thick vapours of the twilight. Beſides the difference of real extenſion of this light in length and breadth at different times, it is diminiſhed by the nearneſs of any other light in the ſky; not to mention that the extent of it will be differently determined by different ſpectators, according to the goodneſs of their eyes.

(142.) Cassini ſuppoſed, that, as by the rotation of the ſun, ſome groſs parts are thrown up on his ſurface, whereof ſpots and nebuloſities are formed; ſo the great rapidity, wherewith the equatorial parts are moved, may throw out, to a conſiderable diſtance, a number of particles, of a much finer texture, of ſufficient denſity to reflect light. That this light was cauſed by an emanation from the ſun, ſimilar to that of the ſpots, he thought probable, from the following obſervation: That after the year 1688, when this light began to grow weaker, no ſpots appeared upon the ſun; whereas, in the preceding years, they were frequently ſeen there; and that the great inequality in the intervals, between the times of the appearances of the ſolar ſpots, has ſome analogy to the irregular returns of weakneſs and ſtrength in this light, in like circumſtances of the conſtitution of the air, and of the darkneſs of the ſky.

(143.) He was alſo of opinion, that this light in the zodiac, as it is ſubject to great increaſe at one time, and diminution at another, may ſometimes become quite imperceptible; and thought this was the caſe in 1665, 1672, and 1681, when he ſaw nothing of it, though he ſurveyed with great attention, thoſe parts of the heavens, where according to his theory, it muſt have appeared, if it had been as viſible then, as it was in others. He cites alſo, paſſages out of ſeveral authors, both ancient and modern, which make it probable, that it had been ſeen, both in former and latter ages, but without being ſufficiently attended to, or its nature inquired into.

(144.) As to the solar spots, Dr Long informs us, that "they do not change their places upon the ſun, but adhere to his ſurface, or float in his atmoſphere, very near his body; and if there be 20 ſpots upon him at a time, they all keep in the ſame ſituation, with reſpect to one another; and, as long as they laſt, are carried round in the ſame manner: By the motion of the ſpots, therefore, we learn, what we ſhould not otherwiſe have known, that *the ſun is a globe, and has a rotation* about his axis."

(145.) Notwithſtanding this, he tells us afterwards, "The ſpots, generally ſpeaking, may be ſaid to adhere to the ſun, or to be ſo near him, as to be carried round upon him uniformly; nevertheleſs, ſometimes, though rarely, a ſpot has been ſeen to move with a velocity a little different from the reſt; ſpots that were different parallels, have appeared to be carried along, not keeping always the ſame diſtance, but approaching nearer to each other; and when two ſpots moved in the ſame parallel, the hindmoſt has been obſerved to overtake and paſs by the other. The revolution of ſpots, near the equator of the ſun, is ſhorter than of thoſe that are more diſtant from it." The apparent change of ſhape in the ſpots, as they approach the circumference of the diſk, according to this author, is likewiſe a proof of the ſun's rotation round his axis, and that they either adhere to the ſurface of the luminary, or are carried round his atmoſphere, very near his ſurface.

(146.) The time of the apparent revolution of a ſpot being known, the true time of its going round upon the ſun may be thus found; In Plate XV. *fig.* 2. the arc AC, which, in the month of May, the earth goes through in her orbit in 27 days 12 hours and 20 minutes, is 26° 22'; the arc *a c* being equal to AC: the apparent revolution of a ſpot is the whole circle *a b r d*, or 360° with the addition of the arc *a c* of 26° 22', which makes 386° 22': then ſay, as 386° 22' is to 27 d. 12 h. 20'; ſo is 360° to 25 d. 15 h. 16'; the true time of the rotation of the ſun, as it would be ſeen from a fixed ſtar.

(147.) The angle of interſection of the ſun's equator with the ecliptic is but ſmall, being never more, according to Scheneir, than 8°, nor leſs than 6°; for which reaſon he ſettled it at 7°, though Caſſini makes 7½. This plane continued cuts the ecliptic in two oppoſite points, which are called the *ſun's nodes*, being 10° of ♎ and 10° of ♈; and two points in the ecliptic, 90° from the nodes, may be called the *limits*. Theſe are 10° of ♋ and ♑ of ♓. When the earth is in either of theſe nodes, the equator of the ſun, if viſible, would appear as a ſtraight line; and, by reaſon of the vaſt diſtance of the ſun from us, all his parallels would likewiſe appear as ſtraight lines; but in every other ſituation of the earth, the equator and parallels of the ſun would, if viſible, appear as ellipſes growing wider the farther the earth is from the nodes, and wideſt of all when the earth is in one of her limits.

(148.) There has been no ſmall ſpeculation reſpecting the nature and formation of the ſolar ſpots. Some have thought that the ſun is an opaque body, mountainous and uneven as our earth is, covered all over with a fiery and luminous fluid; that this fluid is ſubject to ebbing and flowing, after the manner of our tides, ſo as ſometimes to leave uncovered the tops of rocks or hills, which appear like black ſpots; and that the nebuloſities about them are cauſed by a kind of froth. Others have imagined, that the fluid which ſends us ſo much light and heat, contains a nucleus or ſolid globe, wherein are ſeveral volcanoes, which, like Ætna or Veſuvius, from time to time caſt up quantities of bituminous matter to the ſurface of the ſun, and form thoſe ſpots which are ſeen thereon; and that as this matter is gradually conſumed by the luminous fluid, the ſpots diſappear for a time, but are ſeen to riſe again in the ſame places when thoſe volcanoes caſt up new matter. A 3d opinion is, that the ſun conſiſts of a fiery luminous fluid, wherein are immerſed ſeveral opaque bodies of irregular ſhapes; and that theſe bodies, by the rapid motion of the ſun, are ſometimes buoyed or raiſed up to the ſurface, where they form the appearance of ſpots, which ſeem to change their ſhapes according as different ſides of them are preſented to the view. A 4th opinion is, that the ſun conſiſts of a fluid in continual agitation; that, by the rapid motion of this fluid, ſome parts more groſs than the reſt are carried up

to

he ſurface of the luminary, like the ſcum of ted metal riſing up to the top in a furnace: theſe ſcums, as they are differently agitated he motion of the fluid, form themſelves into e ſpots we ſee on the ſolar diſk; and, beſides optical changes already mentioned, grow lar- are diminiſhed in their apparent magnitude, de a little from, or approach nearer to, each r, and are at laſt entirely diſſipated by the inual rapid motion of the fluid, or are other- conſumed or abſorbed.

49.) Dr WILSON, in the 64th volume of the oſophical Tranſactions, advances a new opi-, viz. that they are hollows in the ſurface of luminary. On this ſuppoſition he offers ſome ies and conjectures concerning the nature of ſun himſelf. He aſks, Whether it is not rea- ble to think, that the vaſt body of the ſun is e up of two kinds of matter very different in r qualities; that by far the greateſt part is ſo- nd dark; and that this dark globe is encom- d with a thin covering of that reſplendent tance, from which the ſun would ſeem to de- the whole of his vivifying heat and energy?

50.) This, if granted, will afford a ſatisfactory tion of the appearance of ſpots; becauſe, if part of this reſplendent ſurface ſhall be by means diſplaced, the dark globe muſt neceſ- y appear; the bottom of the cavity correſpon- to the nucleus, and the ſhelving ſides to the ra. The ſhining ſubſtance, he thinks, may iſplaced by the action of ſome elaſtic vapour rated within the ſubſtance of the dark globe. vapour, ſwelling into ſuch a volume as to h up to the ſurface of the luminous matter, ld thereby throw it aſide in all directions: and e cannot expect any regularity in the produc- of ſuch a vapour, the irregular appearance diſappearance of the ſpots is by that means unted for; as the reflux of the luminous mat- nuſt always occaſion the dark nucleus gradu- to decreaſe, till at laſt it becomes indiſtinguiſh- from the reſt of the ſurface.

51.) But an objection occures, That, on this poſition, the nucleus of a ſpot, whilſt on the eaſe, ſhould always appear nearly circular, by gradual deſcent of the luminous matter from ides to cover it. To this Dr Wilſon replies, in all probability the ſurface of the dark globe ery uneven and mountainous, which prevents regular reflux of the ſhining matter: and this, hinks, is rendered very probable by the enor- is mountains and cavities which are obſerved he moon; and why, ſays he, may there not he ſame on the ſurface of the ſun? He thinks ypotheſis alſo confirmed by the dividing of nucleus into ſeveral parts, which might ariſe the luminous matter flowing in different nels in the bottom of the hollow.

52.) The appearance of the umbra after the leus is gone, he thinks, may be owing to a ty remaining in the luminous matter, though dark globe is entirely covered. As to a mo- of the ſpots, diſtinct from what they are ſup- ed to receive from the rotation of the ſun nd his axis, he ſays he never could obſerve , except what might be attributed to the en- gement or diminution of them when in the neighbourhood of one another. "But (ſays he) what would farther contribute towards forming a judgment of this kind, is the apparent alteration of the relative place, which muſt ariſe from the motion acroſs the diſk on a ſpherical ſurface; a circumſtance which I am uncertain if it has been ſufficiently attended to."

(153.) Dr Wilſon's hypotheſis is further confirmly by the diſappearance of the umbræ on the ſides of ſpots contiguous to one another; as the action of the elaſtic vapour muſt neceſſarily drive the luminous matter away from each, and thus as it were accumulate it between them, ſo that no umbra can be perceived. As to the luminous matter itſelf, he conjectures, that it cannot be any very ponderous fluid, but that it rather reſembles a denſe fog which broods on the ſurface of the ſun's dark body.

(154.) Dr Wilſon's general concluſion is, that, "According to the view of things given in the foregoing queries, there would ſeem to be ſomething very extraordinary in the dark and unignited ſtate of the great internal ſpot of the ſun. Does not this, (he aſks) ſeem to indicate that the luminous matter that encompaſſes it derives not its ſplendor from any intenſity of heat? For, if this were the caſe, would not the parts underneath, which would be perpetually in contact with that glowing matter, be heated to ſuch a degree as to become luminous and bright? At the ſame time it muſt be confeſſed, that although the internal globe was in reality much ignited, yet when any part of it forming the nucleus of a ſpot is expoſed to our view, and is ſeen in competition with a ſubſtance of ſuch amazing ſplendor, it is no wonder that an inferior degree of light, ſhould in theſe caſes, be unperceivable.

(155.) "In order (continues the Doctor) to obtain ſome knowledge of this point, I think an experiment might be tried, if we had an opportunity of a very large ſpot, by making a contrivance in the eye-piece of a teleſcope, whereby an obſerver could look at the nucleus alone with the naked eye, without being in danger of light coming from any other part of the ſun. In this caſe, if the obſerver found no greater ſplendor than what might be expected from a planet very near the ſun, and illumined by as much of his ſurface as correſponds to the ſpot's umbra, we might reaſonably conclude, that the ſolar matter, at the depth of the nucleus, is in reality not ignited. But from the nature of the thing, doth there ſeem any neceſſity for thinking that their prevails ſuch a raging and fervent heat as many have imagined? It is proper here to attend to the diſtinction, between this ſhining matter of the ſun, and the rays of light which proceed from it. It may perhaps be thought, that the reaction of the rays upon the matter, at their emiſſion, may be productive of a violent degree of heat. But whoever would uſe this argument in favour of the ſun being intenſely heated, as ariſing from the nature of the thing, ought to conſider, that all poliſhed bodies are leſs and leſs diſpoſed to the heated by the action of the rays of light, in proportion as their ſurfaces are more poliſhed, and as their powers of reflection are brought to a greater degree of perfection. And is there not a ſtrong analogy betwixt the reaction

of light upon matter in cafes where it is reflected, and in cafes where it is emitted?"

(156.) As to the MOON, it is allowed on all hands, that there are prodigious inequalities on her furface. This is proved by looking at her through a telefcope, at any other time than when fhe is full; for then there is no regular line bounding light and darknefs; but the confines of thefe parts appear as it were toothed and cut with innumerable notches and breaks; and even in the dark part, near the borders of the lucid furface, there are feen fome fmall fpaces enlightened by the fun's beams. Upon the fourth day after new moon, there may be perceived fome fhining points like rocks or fmall iflands within the dark body of the moon; and not far from the confines of light and darknefs there are obferved other little fpaces which join to the enlightened furface, but run out into the dark fide, which by degrees change their figure, till at laft they come wholly within the illuminated face, and have no dark parts round them at all. Afterwards many more fhining fpaces are obferved to arife by degrees, and to appear within the dark fide of the moon, which, before they drew near to the confines of light and darknefs, were invifible, being without any light, and totally immerfed in the fhadow. The contrary is obferved in the decreafing phafes, where the lucid fpaces which joined the illuminated furface by degrees recede from it; and, after they are quite feparated from the confines of light and darknefs, remain for fome time vifible, till at laft they alfo difappear. Now it is impoffible, that this fhould be the cafe, unlefs thefe fhining points were higher than the reft of the furface, fo that the light of the fun may reach them.

(157.) Aftronomers have endeavoured to meafure the height of thefe lunar mountains, in the following manner. Let ECD, PLATE XV. fig. 3, be the hemifphere of the moon illuminated by the fun, ECD the diameter of the circle bounding light and darknefs, and A the top of a hill within the dark part when it firft begins to be illuminated. Obferve with a telefcope the proportion of the right line AE, or the diftance of the point A from the lucid furface to the diameter of the moon ED; and becaufe in this cafe the ray of light ES touches the globe of the moon, AEC will be a right angle, and therefore in the triangle AEC having the two fides AE and EC, we can find out the third fide AC; from which fubducting BC or EC, there will remain AB the height of the mountain. By this mode of meafuring, which would be juft if the line AE could be taken accurately, the height of St Catherine would be nearly 8½ miles, if according to Riccioli its top was about a fixteenth part of the moon's diameter diftant from the confines of the lucid furface. But by the more accurate obfervations and juft calculations of Herfchel this difproportionate height appears to be ill founded, and the generality of the lunar mountains do not exceed half a mile in perpendicular elevation. Thus he calculates their heights: Let SLM, or *sim. fig.* 4. be a line drawn from the fun to the mountain, touching the moon at L or *l*, and the mountain at M or *m*. Then, to an obferver at E or *e*, the lines LM, *lm*, will not appear of the fame length, though the mountain fhould be of an equal height; for LM will be projected into *on*, and *lm* into ON. But thefe are the quantities that are taken by the micrometer when we obferve a mountain to project from the line of illumination. From the obferved quantity *on*, when the moon is not in her quadrature, to find LM, we have the following analogy. The triangles *o* OL, *r* ML are fimilar; therefore L *o* : LO : : L *r* : LM, or $\frac{LO \times on}{Lo} = LM$: but LO is the radius of the moon, and L *r* or *on* is the obferved diftance of the mountain's projection; and L *o* is the fine of the angle ROL=*o* LS; which we may take to be the diftance of the fun from the moon without any material error, and which therefore we may find at any given time from an ephemeris.

(158.) Some modern aftronomers have difcovered a ftill greater fimilarity, between the lunar mountains and thofe of our earth? viz. that fome of them are really volcanoes, and emit fire, as ours do. An appearance of this kind was difcovered fome years ago by Ulloa, in an eclipfe of the fun. It was a fmall bright fpot like a ftar near the margin of the moon, and which he at the time fuppofed to have been a hole with the fun's light fhining through it. Succeeding obfervations, however, have induced aftronomers to attribute appearances of this kind to the eruption of volcanic fire: and Herfchel has particularly obferved feveral eruptions of the lunar volcanoes, which he has defcribed in the Philofophical Tranfactions.

(159.) Many conjectures have been formed refpecting the nature of the moon's fubftance. Some have imagined, that, befides the light reflected from the fun, the moon hath alfo fome obfcure light of her own, by which fhe would be vifible without being illuminated by the fun-beams. In proof of this it is urged, that during the time of even total eclipfes the moon is ftill vifible, appearing of a dull red colour, as if obfcured by a great deal of fmoke. In reply to this it hath been advanced, that this is not always the cafe; the moon fometimes difappearing totally in the time of an eclipfe, fo as not to be difcernible by the beft glaffes, while little ftars of the fifth and fixth magnitudes were diftinctly feen as ufual; and when the moon is vifible in a total eclipfe, a fufficient reafon may be afligned for this appearance from the refraction of the fun's rays through our atmofphere, which are reflected back to the earth by the otherwife dark furface of the moon.

(160.) Various fpeculations have alfo been indulged concerning the fpots on the moon's furface. Some philofophers have been fo taken with the beauty of the brighteft places obferved in her difk, that they have imagined them to be rocks of diamonds; and others have compared them to pearls and precious ftones. Keill and the greater part of aftronomers are now of opinion, that thefe are only the tops of mountains, which by reafon of their elevation are more capable of reflecting the fun's light than others which are lower. The duflkifh fpots, he fays, cannot be feas, nor any thing of a liquid fubftance; becaufe, when examined by the telefcope, they appear to conlift of an infinity of caverns and empty pits, whofe fhadows

ſhadows fall within them, which can never be the caſe with ſeas, or any liquid ſubſtance; but, even within theſe ſpots, brighter places are alſo to be obſerved; which, according to his hypotheſis, ought to be the points of rocks ſtanding up within the cavities. Dr Long, however, is of opinion, that ſeveral of the dark ſpots on the moon are real water.

(161.) It has been a matter of diſpute whether the moon has any atmoſphere or not. The following arguments have been urged on the negative ſide: 1. The moon conſtantly appears with the ſame brightneſs where there are no clouds in our atmoſphere; which could not be the caſe, if ſhe were ſurrounded with an atmoſphere like ours, ſo variable in its denſity, and ſo frequently obſcured by clouds and vapours. 2. In an appulſe of the moon to a ſtar, when ſhe comes ſo near it that a part of her atmoſphere is interpoſed between our eye and the ſtar, refraction would cauſe the latter to ſeem to change its place; ſo that the moon would appear to touch it later than by her own motion ſhe would do. 3. Some philoſophers are of opinion, that becauſe there are no ſeas or lakes in the moon, there is therefore no atmoſphere, as there is no water to be raiſed up in vapours.

(162.) To theſe arguments, it has been replied; I. That the moon does not always appear with the ſame brightneſs, even when our atmoſphere appears equally clear. Hevelius relates, that he has ſeveral times found in ſkies perfectly clear, when even ſtars of the 6th and 7th magnitude were viſible, that at the ſame altitude of the moon, and the ſame elongation from the earth, and with one and the ſame teleſcope, the moon and its maculæ do not appear equally lucid, clear, and conſpicuous at all times; but are much brighter and more diſtinct at ſome times than at others. From the circumſtances of this obſervation, ſay they, it is evident that the reaſon of this phenomenon is neither in our air, in the tube, in the room, nor in the ſpectator's eye; but muſt be looked for in ſomething exiſting about the moon. An additional argument is drawn from the different appearances of the moon in total eclipſes, which are ſuppoſed to be owing to the different conſtitutions of the lunar atmoſphere.

(163.) II. To the 2d argument, Dr Long replies, that Sir Iſaac Newton has ſhown, that the weight of any body upon the moon is but a third part of what the weight of the ſame would be upon the earth: now the expanſion of the air is reciprocally as the weight that compreſſes it; the air, therefore, ſurrounding the moon, being preſſed together by a weight, or being attracted towards the centre of the moon, by a force equal only to one third of that which attracts our air towards the centre of the earth, it follows, that the lunar atmoſphere is only one third as denſe as that of the earth, which is too little to produce any ſenſible refraction of the ſtars' light. Other aſtronomers have contended, that ſuch refraction was ſometimes very apparent. Caſſini ſays, that he frequently obſerved Saturn, Jupiter, and the fixed ſtars to have their circular figure changed into an elliptical one, when they approached either to the moon's dark or illuminated limb; though they own, that in other occultations no ſuch change could be obſerved. With regard to the fixed ſtars, indeed, it has been urged, that, granting the moon to have an atmoſphere of the ſame nature and quantity as ours, no ſuch effect as a gradual diminution of light ought to take place; at leaſt, that we could by no means be capable of perceiving it. Our atmoſphere is found to be ſo rare at the height of 44 miles, as to be incapable of refracting the rays of the light. This height is the 180th part of the earth's diameter; but ſince clouds are never obſerved higher than four miles, we muſt conclude that the vaporous or obſcure part is only the 1980th. The mean apparent diameter of the moon is 31′ 29″, or 1889 ſeconds: therefore the obſcure parts of her atmoſphere, when viewed from the earth, muſt ſubtend an angle of leſs than one ſecond; which ſpace is paſſed over by the moon in leſs than two ſeconds of time. It can therefore hardly be expected that obſervation ſhould generally determine whether the ſuppoſed obſcuration takes place or not.

(164.) III. The 3d argument is neceſſarily inconcluſive, becauſe we know not whether there is any water in the moon or not; nor, though this could be demonſtrated, would it follow, that the lunar atmoſphere anſwers no other purpoſe than the raiſing of water into vapour.

(165.) IV. There is, beſides, a ſtrong argument in favour of the exiſtence of a lunar atmoſphere, taken from the appearance of a luminous ring round the moon in the time of ſolar eclipſes; a circumſtance frequently obſerved by aſtronomers, particularly in the *total eclipſe* of the ſun in 1706; and in another total eclipſe of the ſun, in April 1715, certain ſtreaks of light were ſeen to dart from different places of the moon, during the time of total darkneſs. Theſe were imagined to be flaſhes of lightning, and hence the exiſtence of clouds and vapours, and an atmoſphere have been inferred. Theſe flaſhes might be connected with ſuch appearances, as Dr Herſchel, has, with great probability concluded to be volcanoes, which have alſo been conſidered as a proof of the lunar atmoſphere.

(166.) The appearance of a luminous ring has been obſerved in other total eclipſes, and even in ſuch as were annular, though without the luminous ſtreaks of lightning above mentioned; and ſome members of the academy at Paris have endeavoured to account for them without having recourſe to a lunar atmoſphere; and for that purpoſe they made the following experiments.

(167.) The image of the ſun, coming through a ſmall hole into a darkened room, was received upon a circle of wood or metal, of a diameter a good deal larger than that of the ſun's image; then the ſhadow of this opaque circle was caſt upon white paper, and there appeared round it, on the paper, a luminous circle ſuch as that which ſurrounds the moon. The like experiment being made with a globe of wood, and with another of ſtone not poliſhed, the ſhadows of both theſe caſt upon paper were ſurrounded with a paliſh light, moſt vivid near the ſhadows, and gradually more faint at a diſtance from them. They obſerved alſo, that the ring round the moon, was ſeen in the eclipſe of

1706 by Wurzelbaur, who caſt her ſhadow upon white paper. The ſame appearance was obſerved on holding an opaque globe in the ſun, ſo as to cover his whole body from the eye; for, looking at it through a ſmoked glaſs, the globe appeared ſurrounded with a light reſembling that round the moon in a total eclipſe of the ſun.

(168.) Thus they ſolve the phenomenon of the ring ſeen round the moon by the inflection, or *diffraction* as they call it, of the ſolar rays paſſing near an opaque ſubſtance. As for the ſmall ſtreaks of light, ſuppoſed to be lightning, they explain theſe by an hypotheſis concerning the cavities of the moon themſelves; which they conſider as concave mirrors reflecting the light of the ſun nearly to the ſame point; and as theſe are continually changing their ſituation with great velocity by the moon's motion from the ſun, the light which any one of them ſends to our eye is ſeen but for a moment. This, however, does not account for the flaſhes, if any ſuch there are, ſeen near the centre of the diſk; though it does, in ſome meaſure, account for thoſe at the edges, but not ſatisfactorily.

(169.) We have already obſerved, that the occultations of the fixed ſtars and planets, by the moon, in general happen without any kind of refraction of their light by the lunar atmoſphere. The contrary, however, has ſometimes, it is ſaid, been obſerved, and the ſtars have been ſeen manifeſtly to change their ſhape and colour on going behind the moon's diſk; but by many this colour has been attributed rather to the different refrangibility of the rays, in the object glaſs of the teleſcope, than to any real variation of colour in the planets or ſtars from appulſe to the moon.

(170.) It has been a queſtion, whether the moon and other planets are inhabited? The anſwers given to it in the negative depend on the poſition, that human beings could not exiſt in any of the planets on account of their diſtance from the ſun, and conſequent inequality of heat to that which the inhabitants of the earth experience; and the want of an atmoſphere in the moon would as effectually preclude that body from being a fit habitation for man. But in reply it is argued, and with reaſon, that the ſame power which could make the earth a fit habitation for the animals upon it, could alſo adapt the organs of other animals to their various ſituations in the planets: and as the earth teems with life of all kinds, we may conclude, that as there is ſo great analogy between it and the planets in other reſpects, the ſame analogy prevails with reſpect to life and inhabitants.

Sect. IV. Conjectures *and* Conclusions *reſpecting* Comets.

(171.) None of the celeſtial bodies have given riſe to a greater degree of ſpeculations and conjectures, than the comets. Their ſtrange appearance has in all ages been a matter of terror to the vulgar, who uniformly have looked upon them as bad omens and forerunners of war, peſtilence, &c. Others, leſs ſuperſtitious, ſuppoſed them to be meteors raiſed in the higher regions of the air.

(172.) Some part of the modern doctrine concerning them however was received into the ancient Italic and Pythagorean ſchools; for they held them to be ſo far of the nature of planets, that they had their periodical times of appearing; that they were out of ſight for a long time, while they were carried aloft at an immenſe diſtance from the earth, but became viſible when they deſcended into the lower regions of the air, and thus were nearer to us.

(173.) Aristotle aſſerted that the heavens were unchangeable, and not liable to generation or corruption. Comets, therefore, which he believed to be generated when they firſt made their appearance, and deſtroyed when they vaniſhed from our ſight, he maintained, could not be heavenly bodies, but rather meteors or exhalations raiſed into the upper regions of the atmoſphere, where they blazed out for a while, and diſappeared when the matter of which they were formed was conſumed.

(174.) Seneca plainly intimates, that he thought them above the moon; and argues ſtrongly againſt thoſe who ſuppoſed them to be meteors, or held other abſurd opinions concerning them; declaring his belief that they were not fire ſuddenly kindled, but the eternal productions of nature. He points out alſo the only way to come at a certainty on this ſubject, viz. by collecting a number of obſervations concerning their appearance, in order to diſcover whether they return periodically or not. "For this purpoſe (ſays he) one age is not ſufficient; but the time will come when the nature of comets and their magnitudes will be demonſtrated, and the routes they take, ſo different from the planets, explained. Poſterity will then wonder that the preceding ages ſhould be ignorant of matters ſo plain and eaſy to be known."

(175.) The prediction of Seneca ſeemed for a long time very unlikely to be fulfilled. The great authority which Ariſtotle maintained for many ages determined them to be nothing but meteors caſually lighted up in the air; though they were manifeſtly at a great height, not only above the clouds, but ſubject to the diurnal revolution of the earth. In the dark and ſuperſtitious ages, they were held to be the forerunners of every kind of calamity, and were ſuppoſed to have different degrees of malignity according to the ſhape they aſſumed; from whence alſo they were differently denominated. Thus, ſome were ſaid to be *bearded*, ſome *hairy*; ſome to repreſent a *beam*, *ſword*, or *ſpear*; others a *target*, &c.; whereas modern aſtronomers acknowledge only one ſpecies of comets, and account for their different appearances from their different ſituations and diſtances from the ſun and earth.

(176.) Kepler, in other reſpects a very great genius, indulged the moſt extravagant conjectures not only concerning comets, but the whole ſyſtem of nature. The planets he imagined to be huge *animals*, who ſwam round the ſun by means of certain fins acting upon the ethereal fluid as thoſe of fiſhes do on the water: and agreeable to this notion, he imagined the comets to be monſtrous and uncommon animals generated in the celeſtial ſpaces; and he explained how the air engendered them by an animal faculty!

(177.) John Bodin, a learned Frenchman of the 16th century, entertained an opinion, if poſſible, ſtill more ridiculous. He maintained that comets "are *ſpirits* which having lived on the earth innumerable ages, and being at laſt arrived

on the confines of death, celebrated their laſt triumph, or are recalled to the firmament like ſhining ſtars! This is followed by famine, plague, &c. becauſe the people deſtroy the governors and chiefs who appeaſe the wrath of God!"

(178.) Others have denied even the exiſtence of comets, and maintained that they were only falſe appearances occaſioned by the refraction or reflection of light. The firſt rational conjecture among the moderns we meet with is that of James Bernouilli, who imagined them to be the ſatellites of ſome very diſtant planet, which was inviſible to us on account of its diſtance, as were alſo the ſatellites, unleſs when in a certain part of the courſe.

(179.) The firſt aſtronomer who reſtored the comets to their true rank in the creation, was TYCHO BRAHE. Before his time ſeveral had been obſerved with tolerable exactneſs by Regiomontanus, Appian, Fabricius, and others; yet they thought them below the moon. But Tycho, being provided with much better inſtruments, ſet himſelf with great diligence to obſerve the famous comet of 1577; and from many careful obſervations deduced that it had no ſenſible diurnal parallax; and therefore was not only far above the regions of our atmoſphere, but much higher than the moon. But though few have come ſo near the earth as to have any diurnal parallax, all of them have what may be called an annual parallax; that is, the revolution of the earth in her orbit cauſes their apparent motion to be very different from what it would be if viewed from the ſun: and this ſhows them to be much nearer than the fixed ſtars, which have no ſuch parallax. Kepler, the diſciple of Tycho, was alſo very attentive to the motion of the comets, and found that they did not move in ſtraight lines, as had been ſuppoſed. He ſhowed that their paths were concave towards the ſun, and ſuppoſed them to move in parabolic trajectories.

(180.) Sir ISAAC NEWTON at laſt diſcovered their true motion, from the obſervations he made on the great comet of 1680. This deſcended almoſt perpendicularly towards the ſun with a prodigious velocity; aſcending again with a motion retarded, as much as it had been before accelerated. It was ſeen in the morning by a great number of aſtronomers in different parts of Europe, from the 4th to the 25th of November, in its way toward the ſun; and in the evening from the 12th of December to the 9th of March following. The many exact obſervations made on this comet enabled Sir Iſaac Newton to determine, that they are a kind of planets, which move in very excentric ellipſes; and this opinion is now conſidered as an eſtabliſhed truth.

(181.) It has been remarkable that a greater number of comets is ſeen in the hemiſphere towards the ſun than in the oppoſite; the reaſon of which will eaſily appear from fig. 5. Plate XV. wherein S repreſents the ſun, E the earth, A B C D the ſphere of the fixed ſtars; and becauſe comets neither reflect light enough to be viſible, nor emit tails conſpicuous enough to attract our notice, till they come within the planetary regions, commonly a good way within the ſphere of Jupiter, let K L M N be a ſphere concentric to the ſun, at ſuch a diſtance from him, that no comet can be ſeen by us till it come within that diſtance; through E draw the plane B D perpendicular to S E, which will divide the ſphere K L M N into two hemiſpheres, one of which, B C D, is toward the ſun, the other D A B, oppoſite. Now it is manifeſt, that the ſpherical portion L M N, which is in the hemiſphere B C D toward the ſun, is larger than the portion N K L in the hemiſphere oppoſite to him; and conſequently a greater number of comets will appear in the hemiſphere B C D than in that marked D A B.

(182.) Although the orbs of all comets are very excentric ellipſes, there are vaſt differences among them. Excepting Mercury, there are no great differences among the planets either as to the excentricity of their orbits, or the inclination of their planes; but the planes of ſome comets are almoſt perpendicular to others, and ſome of their ellipſes are much wider than others. The narroweſt ellipſis of any comet hitherto obſerved was that of 1680. There is alſo a much greater inequality in the motion of the comets than of the planets; the velocity of the former being incomparably greater in their perihelion than in their aphelion; but the planets are but very little accelerated.

(183.) It is now the general opinion of aſtronomers, that comets are opaque bodies enlightened by the ſun. Hevelius, in a large work, wherein he gives the opinions of various authors on the ſubject, mentions ſome who were of the ſame ſentiments with himſelf, that comets were ſo far tranſparent as to let the light of the ſun paſs through them, which formed their tails. Sir Iſaac Newton was of opinion, that they are quite opaque; and in confirmation of this, he obſerves, that if a comet be ſeen in two parts of its orbit, at equal diſtances from the earth, but at unequal diſtances from the ſun, it always ſhines brighteſt in that neareſt the ſun.

(184.) Comets are of very different MAGNITUDES, which may be conjectured from their apparent diameter and brightneſs. Thus the head of a comet, when of the ſame brightneſs and apparent diameter with Saturn, may be ſuppoſed to be nearly about the ſame magnitude with that planet; though this muſt be attended with ſome uncertainty, as we know not whether the heads of comets reflect the ſun's light in the ſame manner the planets do.

(185.) TYCHO BRAHE found the diſtance of the comet of 1577 to be about 210 ſemidiameters of the earth, or about 840,000 miles diſtant from us, its apparent diameter being ſeven minutes; whence he concluded, that the true diameter of the comet was to that of the earth as 3 to 14. Hevelius, from the parallax and apparent diameter of the head of the comet in 1652, computed its diameter to be to that of the earth as 52 to 100. By the ſame method he found the diameter of the head of the comet of 1664 to be at one time 12 ſemidiameters of the earth, and at another not much more than 5: and the diameter of the nucleus of the comets of 1661 and 1665 to be only about a tenth part of that of the earth; and

Cyſatus

Cyſatus makes the true diameter of the comet of 1618 to be about the ſame ſize.

(186.) But the diameter of the atmoſphere is often 10 or 15 times as great as that of the nucleus, the former in the comet of 1682, was found by Flamſtead to be 2′ when the diameter of the nucleus was 11 or 12″. The diameter of the comet of 1744, when at the diſtance of the ſun from us, was about 1′, hence its diameter was about 3 times that of the earth, at another time the diameter of the nucleus was nearly equal to Jupiter.

(187.) Some comets, however, from their apparent magnitude and diſtance, have been ſuppoſed to be much larger than the moon, or even equal in magnitude to ſome of the primary planets; and ſome have imagined that, by an interpoſition of theſe bodies betwixt the earth and ſun, we might account for thoſe darkneſſes which cannot be derived from any interpoſitions of the moon. Such are thoſe mentioned by Herodotus, lib. 7. cap. 37. and lib. 9. cap. 70; likewiſe the eclipſe mentioned by Dion, which happened a little before the death of Auguſtus; and it is obſervable that Seneca ſaw a comet that year. Some have even attempted to account in this manner for the darkneſs which happened at our Saviour's crucifixion; and indeed it is certain, that were a comet in its perigee to come between the earth and ſun, and to be moving the ſame way with the earth, it muſt cauſe a darkneſs much more intenſe, as well as of more conſiderable duration, than what could take place in any lunar eclipſe.

(188.) The TAILS of comets have given riſe to various conjectures; though it is acknowledged by all, that they depend on the ſun ſome way or other, as they are always turned from him; but in what manner this is accompliſhed, we cannot eaſily determine. Appian, Tycho Brahe, and others, thought the tail was formed by the ſun's rays tranſmitted through the nucleus of the comet, which they fancied tranſparent, and was there refracted as in a lens of glaſs, ſo as to form a beam of light behind the comet: but this cannot be the caſe, both becauſe the figure of a comet's tail does not anſwer to ſuch a refraction, and becauſe ſuch refracted light would not be ſeen by a ſpectator placed ſidewiſe to it, unleſs it fell upon ſome ſubſtance ſufficiently denſe to cauſe a reflection. Des Cartes and his followers were of opinion, that the tail of a comet was owing to the refraction of its head: but if this were the caſe, the planets and principal fixed ſtars would have tails alſo; for the rays from them paſs through the ſame medium as the light from the comets.

(189.) Sir ISAAC NEWTON was of opinion, that the tail of a comet is a very thin vapour which the head ſends out by reaſon of its heat: that it aſcends from the ſun juſt as ſmoke does from the earth: that as the aſcent of ſmoke is cauſed by the rarefaction of the air wherein it is entangled, cauſing ſuch air to aſcend and carry the ſmoke up with it; ſo the ſun's rays acting upon the coma or atmoſphere of the comet, do by rarefaction and refraction heat it: that this heated atmoſphere heats, and thus rarefies the ether that is involved therein; and that the ſpecific gravity, with which ſuch ether tends to the ſun, is ſo diminiſhed by its rarefaction, that it will now aſcend from him by its relative lightneſs, and carry with it the reflecting particles whereof the tail is compoſed. Though the immenſely large tails of ſome comets ſeem to require a great quantity of matter to produce them, they afford no objection to this ſolution: for every day's experience ſhows what a great quantity of ſmoke is produced from a very little wood or coal; and Newton has demonſtrated, that a cubic inch of air equally rarefied with that at the diſtance of a ſemidiameter from the earth's ſurface, would fill all the planetary regions to the orbit of Saturn and beyond.

(190.) MARIAN ſuppoſed the tails of the comets to be formed out of the luminous matter whereof the ſun's atmoſphere conſiſts, to extend as far as the orbit of the earth, and to furniſh matter for the aurora borealis. De la Lande joins the two laſt opinions together. Part of the matter which forms the tails of comets he ſuppoſes to ariſe from their own atmoſphere rarefied by heat and puſhed forward by the force of the light ſtreaming from the ſun: and alſo that a comet paſſing through the ſun's atmoſphere is drenched therein, and carries away ſome of it.

(191.) ROWNING objects to Newton's theory, that it can hardly be ſuppoſed the thin vapour of the tail ſhould go before the more ſolid body of the comet, when its motion is ſometimes ſo extremely ſwift, as that of ſome of the comets is ſaid to be after the rate (as Newton calculated the motion of the comet of 1680 to be) of no leſs than 880,000 miles an hour. He therefore ſuppoſes the atmoſphere of the comet to extend every way round it as far as the tail reaches; and that the part of it which makes the tail is diſtinguiſhed from the reſt, ſo as to fall thick upon that part of the atmoſphere which goes before the comet in its progreſs along its elliptic orbit. The greateſt objection to this is the immenſe magnitude of the atmoſpheres, as it muſt now be ſuppoſed, to account for the vaſt lengths of the tails of ſome comets, which have been ſaid to meaſure above 80 millions of miles.

(192.) M. EULER thinks there is a great affinity between the tails of the comets, the zodaical light, and the aurora borealis; and that the common cauſe of them all is the action of the ſun's light on the atmoſpheres of the comets, of the ſun, and of the earth. He ſuppoſes, that the impulſe of the rays of light, on the atmoſphere of comets, may drive ſome of its finer particles far beyond the limits of that atmoſphere, and that this force of impulſe combined with that of gravity towards the comet, would produce a tail, which would always be in oppoſition to the ſun, if the comet did not move. But the motion of the comet in its orbit, and about its axis, muſt vary the poſition and figure of the tail, giving it a curvature and deviation from the right line joining the centre of the ſun and comet, which deviation will be greater as the orbit of the comet has the greater curvature, and as its motion is the more rapid. The velocity of the comet in its perihelion may be ſo great that the force of the ſolar rays may produce a new tail before the old one can follow. The poſſibility of this was confirmed by the comet of 1744, which had ſeveral tails while it was in its perihelion.

(193.) The

(193.) The reſemblance between the tails of comets and the aurora borealis, which is commonly conſidered as an electrical phænomenon, has ſuggeſted an opinion far from being improbable, that the tails of comets are ſtreams of electric matter. HAMILTON, in a ſmall treatiſe, intitled, *Conjectures on the Nature of the Aurora Borealis, and on the Tails of Comets*, ſuppoſes that the comets are of uſe to bring back the electric fluid to the planets, which is continually diſcharged from the higher regions of their atmoſpheres.

(194.) The near approach of ſome comets to the ſun ſubjects them to intenſe and inconceivable degrees of heat. Newton calculated that the heat of the comet of 1680 muſt have been near 2000 times as great as that of red-hot iron. The calculation is founded upon this principle, that the heat of the ſun falling upon any body at different diſtances is reciprocally as the ſquares of thoſe diſtances; but it may be obſerved, that the effect of the heat of the ſun upon all bodies near our earth depends very much on the conſtitution of thoſe bodies, and of the air that ſurrounds them.

(195.) Mr WHITSON, from Flamſtead's meaſure of its apparent diameter, concluding the nucleus of the comet to be about ten times as big as the moon, or equal to a 4th part of the earth, attributes the univerſal deluge to the near approach thereof. His opinion was, that the earth paſſing through the atmoſphere of the comet, attracted therefrom great part of the water of the flood; that the nearneſs of the comet raiſed a great tide in the ſubterraneous waters, ſo that the outer cruſt of the earth was changed from a ſpherical to an oval figure; that this could not be done without making fiſſures and cracks in it, through which the waters forced themſelves, by the hollow of the earth being changed into a leſs capacious form; carrying along with them trees, animals, fiſhes, &c. the bones, ſhells, and other relics, which are often found at great depths in the earth. The ſame comet, he thought, would probably, coming near the earth when heated in an immenſe degree in its perihelion, be the inſtrumental cauſe of that great cataſtrophe, the general conflagration, foretold in the ſacred writings, and conjectured from ancient tradition.

(196.) The analogy diſcovered by Kepler, between the periodical times of the planets and their diſtances from the ſun, takes place alſo in the comets. In conſequence of this, the mean diſtance of a comet from the ſun may be found by comparing its period with the time of the earth's revolution round the ſun. Thus the period of the comet that appeared in 1531, 1607, 1682, and 1759, being about 76 years, its mean diſtance from the ſun may be found by this proportion: As 1, the ſquare of one year, the earth's periodical time, is to 4776 the ſquare of 76, the comet's periodical time; ſo is 1,000,000, the cube of 100, the earth's mean diſtance from the ſun, to 5,776,000,000, the cube of the comet's mean diſtance. The cube root of this laſt number is 1794; the mean diſtance itſelf in ſuch parts as the mean diſtance of the earth from the ſun contains 100. If the perihelion diſtance of the comet, 58, be taken from 3588 double the mean diſtance, we ſhall have the aphelion diſtance, 3530, of ſuch parts as the diſtance of the earth contains 100; which is a little more than 35 times the diſtance of the earth from the ſun. By a like method, the aphelion diſtance of the comet of 1680 comes out 138 times the mean diſtance of the earth from the ſun, ſuppoſing its period to be 575 years: ſo that this comet, in its aphelion, goes more than 14 times the diſtance from the ſun that Saturn does. Euler computes the orbit of this comet from three of Flamſtead's obſervations taken near together, compared with a fourth taken at ſome diſtance from the other three; and from thence concludes the period to be a little more than 170 years.

(197.) The period of the comet of 1744 is much longer than even that of 1680. BETTS, in attempting to compute the tranſverſe axis of its orbit, found it come out ſo near infinite, that though the orbit ſhowed itſelf in this manner to be a very long one, he found it impoſſible to calculate it without ſome obſervations made after its perihelion. Dr HALLEY, after he had finiſhed his tables of comets, found ſuch a ſimilitude in the elements of thoſe of 1531, 1607, and 1682, that he was induced to believe them to be returns of the ſame comet in an elliptic orbit: but as there was ſuch a difference in their periodical times and inclinations of their orbits as ſeemed to make againſt this opinion; and as the obſervations of the firſt of them in 1631 by Appian, and the 2d in 1607 by Kepler, were not exact enough to determine ſo nice a point when he firſt publiſhed his ſynopſis in 1705; he only mentioned this as a thing probable, and recommended it to poſterity to watch for an appearance of the ſame in 1758.

(198.) Dr HALLEY, looking over the catalogue of ancient comets, and finding three others at equal intervals with thoſe now mentioned, afterwards grew more poſitive in his opinion; and knowing a method of calculating with eaſe a motion in an elliptic orbit, how excentric ſoever it might be, inſtead of the parabolic orbit which he had given for the comet of 1682, he ſet about adapting the plan of that orbit to an ellipſis of a given ſpace and magnitude, having the ſun in one of its foci, ſo as to tally with the obſervations of that comet made by Flamſtead with great accuracy, by the help of a very large ſextant. He likewiſe corrected the places of the comet of 1551 from Appian, and thoſe of the comet of 1607 from Kepler and Longomontanus, by rectifying the places of the ſtars they had made uſe of, and found thoſe places agree as well with the motion in ſuch an ellipſis as could be expected from the manner of obſerving of theſe aſtronomers, and the imperfections of their inſtruments.

(199.) The greateſt objection to this theory was ſome difference in the inclination of the orbits, and that there was above a year's difference between the two periods. The comet of 1531 was in its perihelion Auguſt 24; that of 1607, October 16; and that of 1682, September 4: ſo that the firſt of theſe periods was more than 76, the latter not quite 75 years. To obviate this, he reminds his readers of an obſervation made by him of the periodical revolution of Saturn having at one time been about 13 days longer than at another time; occaſioned, as he ſuppoſed, by the near approach of Saturn and Jupiter, and the mutual attraction

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and gravitation of the two planets; and obſerves, that in the ſummer 1581, the comet in its deſcent was for ſome time ſo near Jupiter, that its gravitation towards that planet was one 50th part of its gravitation towards the ſun. This he concluded, would cauſe a change in the inclination of its orbit, and alſo in the velocity of its motion: for by continuing longer near the planet Jupiter on the ſide moſt remote from the ſun, its velocity would be more increaſed by the joint forces of both thoſe bodies, than it would be diminiſhed by them acting contrarywiſe, when on the ſide next the ſun where its motion was ſwifteſt. The projectile motion being thus increaſed, its orbit would be enlarged, and its period lengthened; ſo that he thought it probable it would not return till after a longer period than 76 years, about the end of the year 1758 or beginning of 1759.

(200.) Dr Halley having expreſſed his opinion modeſtly, though clearly enough, that this comet would appear again about the end of 1758, or the beginning of the following year, De La Lande alledged he muſt have been at a loſs to know whether the period he foretold would have been of 75 or 76 years; that he did not give a deciſive prediction, as if it had been the reſult of calculation; and that by conſidering the affair in ſo looſe a manner as Halley did, there was a good deal of room for objecting to his reaſoning.

(201.) M. De la Lande is very full in his commendation of the performance of Clairault; who, he ſays, not only calculated ſtrictly the effect of the attraction of Jupiter in 1681 and 1683, when the comet was again near Jupiter, but did not neglect the attraction of that planet when the comet was moſt diſtant; that he conſidered the uninterrupted attractions of Jupiter and Saturn upon the ſun and upon the comet, but chiefly the attractions of Jupiter upon the ſun, whereby that luminary was a little diſplaced, and gave different elements to the orbit of the comet. By this method he found the comet would be in its perihelion about the middle of April; but that, on account of ſome ſmall quantities neceſſarily neglected in the method of approximation made uſe of by him, Clairault deſired to be indulged 1 month; and that the comet came juſt 30 days before the time he had fixed for its appearance.

(202.) It ſeems evident, indeed, from the inſtance juſt mentioned, that comets may have their motion diſturbed by the planets, eſpecially by the two largeſt, Jupiter and Saturn. They may alſo affect one another by their mutual gravitation when out of the planetary regions; but of this we can take no account, nor can we eſtimate the reſiſtance of the ether through which they paſs; and yet both theſe cauſes may have ſome influence on the inclination of their orbits and the length of their periods.

Sect. V. Conjectures *and* Conclusions *reſpecting the* Fixed Stars.

(203.) Aſtronomers have ſuppoſed the innumerable multitude of fixed ſtars to be ſo many ſuns, each of which is attended by a certain number of planets or habitable worlds like our own, as well as viſited by comets. The ſtrongeſt argument for this hypotheſis is, that the ſtars cannot be magnified by a teleſcope on account of their immenſe diſtance; whence we muſt conclude they ſhine by their own light, and are therefore ſo many ſuns; each of which we may ſuppoſe to be equal, if not ſuperior, in luſtre and magnitude to our own.—They are not ſuppoſed to be at equal diſtances from us, but to be more remote in proportion to their apparent ſmallneſs. This ſuppoſition is neceſſary to prevent any interference of their planets and thus there may be as great a diſtance between a ſtar of the firſt magnitude and one of the ſecond apparently cloſe to it, as between the earth and the fixed ſtars firſt mentioned.

(204.) Others object, that the diſappearance of ſome of the fixed ſtars is a demonſtration that they cannot be ſuns, as it would be to the higheſt degree abſurd, to think that God would create a ſun which might diſappear of a ſudden, and leave its planets and their inhabitants in endleſs night. But this argument will have no weight with thoſe who believe in the doctrines of revelation; which aſſures us, that our world will come to an end and that our ſun will be deprived of his light; and conſequently that all the planets, which circulate around him, will be involved in darkneſs.

(205.) In ſhort, there is nothing inconſiſtent with either ſcripture or reaſon, in ſuppoſing, that while infinite ſpace is univerſally filled with illuminating ſuns, and circulating planets, each world, or rather each *ſolar ſyſtem* of worlds, has its own periods of creation, duration, and final conſummation; as we are aſſured ours *has* had, and *will* have. And the diſcoveries of aſtronomers reſpecting old ſtars diſappearing, and new ones being obſerved, are perfectly conſiſtent with the doctrines of creation and diſſolution, which all Chriſtians profeſs to believe, with regard to our own ſolar ſyſtem and the globe we inhabit: (See a hint reſpecting the creation of other worlds, under Angels, § 6.) They ſeem to afford, likewiſe, a pretty ſtrong argument againſt the theories of Dr Toulmin and other philoſophers, who plead for the *eternity of the world*, and *of the univerſe*.

(206.) Some, however, have thought that the variable ſtars which diſappear for a time, were planets, which were only viſible during ſome part of their courſe. But this, their apparent immobility, notwithſtanding their decreaſe of luſtre, will not allow us to think. Some have imagined that one ſide of them might be naturally much darker than the other, and when, by the revolution of the ſtar upon its axis, the dark ſide was turned towards us, the ſtar became inviſible, and for the ſame reaſon, after ſome interval, returned its former luſtre.

(207.) M. Maupertuis is of opinion that ſome ſtars, by their prodigious quick rotations, on their axis, may not only aſſume the figures of oblate ſpheroids, but that, by the great centrifugal force ariſing from ſuch rotations, they may become of the figures of mill-ſtones, or be reduced to flat circular planes, ſo thin as to be quite inviſible when their edges are turned towards us; as Saturn's ring is in ſuch poſitions. But when very excentric planets or comets go round any flat ſtar, in orbits much inclined to its equator, the attraction of the planets or comets in their perihelions muſt alter the inclination of the axis of that ſtar;

hich account it will appear more or less large uminous, as its broad side is more or less d towards us. And thus he imagines we account for the apparent changes of magni- and lustre in those stars, and likewise for appearing and disappearing.

208.) Mr Dun, in a dissertation concerning pparent increase of magnitude in the heaven- odies when they approach the horizon, in- d in the LIId vol. of the Philsophical Trans- ns, conjectures that the interposition of some atmosphere may solve the phænomena both bulous and new stars.

209.) In the same work for 1783, however, CHELL, in proposing a method to determine distance, magnitude, &c. of the fixed stars, he diminution of the velocity of their light, ld any such thing be discovered, supposes that far the greater part, if not all of them, are ems of stars so near each other, as probably to liable to be affected sensibly by their mutual itation; and that it is therefore not unlikely the periods of the revolutions of some of these ut their principals (the smaller ones being, u this hypothesis, to be considered as satellites he others) may some time or other be disco- ed.

210.) HERSCHEL, improving on Michell's idea the fixed stars being collected into groups, and sted by his own observations with the extra- linary telescopic powers already mentioned, has ggested a theory concerning the construction of universe entirely new and singular. It had en the opinion of former astronomers, that our n, besides occupying the centre of the system ich properly belongs to him, occupied also the ntre of the universe: but Herchel is of a differ- t opinion.

(211.) "Hitherto (says the Dr) the sidereal hea- ns have, not inadequately for the purpose de- gned, been represented by the concave surface a sphere, in the centre of which the eye of the bserver might be supposed to be placed. It is ue, the various magnitudes of the fixed stars even ien plainly suggested to us, and would have bet- r suited, the idea of an expanded firmament of hree dimensions; but the observations upon which am now going to enter, still farther illustrate and nforce the necessity of considering the heavens in his point of view. In future therefore we shall ook upon those regions into which we may now penetrate by means of such large telescopes, as a naturalist regards a rich extent of ground or chain of mountains, containing strata variously inclined and directed, as well as consisting of very differ- ent materials. A surface of a globe or map there- fore will but ill delineate the interior parts of the heavens"

(212.) Dr HERSCHEL's observations, on which this theory is founded, were made with a Newto- nian reflector of 20 feet focal length, and an aper- ture of 18 inches. With this powerful telescope, he first began to survey the Via Lactea, and found that it completely resolved the whitish appearance into stars, which the telescopes he formerly used had not light enough to do. The portion he first observed was that about the hand and club of O- rion; in which he found an astonishing multitude of stars, whose number he endeavoured to esti- mate by counting many *fields*, (or *apparent spaces* of the heavens, which he could see at once through his telescope,) and computing from a medium of these how many might be contained in a given portion of the Milky Way. In the most vacant place to be met with in that neighbourhood, he found 63 stars; other 6 fields contained 110, 60, 70, 90, 70, and 74 stars; a medium of all which gave 79 for the number of stars to each field.— Thus he found, that by allowing 15′ for the dia- meter of his field of view, a belt of 15° long and 2 broad, which he had often seen pass before his telescope in an hour's time, could not contain less than 50,000 stars, large enough to be distinctly numbered; besides which, he suspected twice as many more, which could be seen only now and then by faint glimpses for want of sufficient light.

(213.) The Doctor's success within the Milky Way soon induced him to turn his telescope to the nebulous parts of the heavens, of which an accurate list had been published in the *Connaissance des Temps* for 1783 and 1784. Most of these yield- ed to a Newtonian reflector of 20 feet focal dis- tance and 12 inches aperture; which plainly dis- covered them to be composed of stars, or at least to contain stars, and to shew every other indica- tion of consisting of them entirely.

(214.) "The nebulæ (says he) are arranged in- to strata, and run on to a great length; and some of them I have been able to pursue, and to guess pretty well at their form and direction. It is pro- bable enough, that they may surround the whole starry sphere of the heavens, not unlike the Milky Way, which undoubtedly is nothing but a stra- tum of fixed stars; and as this latter immense starry bed is not of equal breadth or lustre in every part, nor runs on in one straight direction, but is curved, and even divided into two streams along a very considerable portion of it; we may like- wise expect the greatest variety in the strata of the clusters of stars and nebulæ.

(215.) "One of these nebulous beds is so rich, that, in passing through a section of it in the time of only 36 minutes, I have detected no less than 31 nebulæ, all distinctly visible upon a fine blue sky. Their situation and shape, as well as condi- tion, seem to denote the greatest variety imagin- able. In another stratum, or perhaps a different branch of the former, I have often seen double and treble nebulæ variously arranged; large ones with small seeming attendants; narrow, but much extended lucid nebulæ or bright dashes; some of the shape of a fan, resembling an electric brush issuing from a lucid point; others of the cometic shape, with a seeming nucleus in the centre, or like cloudy stars, surrounded with a nebulous at- mosphere: a different sort again contain a nebu- losity of the Milky kind, like that wonderful in- explicable phænomenon about θ Orionis; while others shine with a fainter mottled kind of light, which denotes their being resolvable into stars.

(216.) "It is very probable that the great stra- tum called the *Milky Way*, is that in which the sun is placed, though perhaps not in the very centre of its thickness. We gather this from the appearance of the galaxy, which seems to encom- pass the whole heavens, as it certainly must do if

the ſun is within the ſame. For ſuppoſe a number of ſtars arranged between two parallel planes, indefinitely extended every way, but at a given conſiderable diſtance from one another, and calling this a ſidereal ſtratum; an eye, placed ſomewhere within it, will ſee all the ſtars in the direction of the planes of the ſtratum projected into a great circle, which will appear lucid on account of the accumulation of the ſtars, while the reſt of the heavens at the ſides will only ſeem to be ſcattered over with conſtellations, more or leſs crowded according to the diſtance of the planes, or number of ſtars contained in the thickneſs or ſides of the ſtratum.

(217.) "Thus in *fig.* 6. *Plate* XV. an eye at S within the ſtratum *a b*, will ſee the ſtars in the direction of its length *a b*, or height *e d*, with all thoſe in the intermediate ſituation, projected into the lucid circle ABCD; while thoſe in the ſides *m e*, *n w*, will be ſeen ſcattered over the remaining part of the heavens at MVNW. If the eye were placed ſomewhere without the ſtratum, at no very great diſtance, the appearance of the ſtars within it would aſſume the form of one of the leſſer circles of the ſphere, which would be more or leſs contracted to the diſtance of the eye; and if this diſtance were exceedingly increaſed, the whole ſtratum might at laſt be drawn together into a lucid ſpot of any ſhape, according to the poſition, length, and height of the ſtratum. Let us now ſuppoſe, that a branch or ſmaller ſtratum ſhould run out from the former in a certain direction, and let it alſo be contained between two parallel planes extended indefinitely onwards, but ſo that the eye may be placed in the great ſtratum ſomewhere before the ſeparation, and not far from the place where the ſtrata are ſtill united; then will this ſecond ſtratum not be projected into a bright circle like the former, but will be ſeen as a lucid branch proceeding from the firſt, and returning to it again at a certain diſtance leſs than a ſemicircle. Thus, in the ſame figure, the ſtars in the ſmall ſtratum *p g*, will be projected into a bright arch at PRB, which, after its ſeparation from the circle CBD, unites with it again at P.

(218.) "What has been inſtanced in parallel planes may eaſily be applied to ſtrata irregularly bounded, and running in various directions; for their projection will of conſequence vary according to the quantities of the variations in the ſtrata and the diſtance of the eye from the ſame. And thus any kind of curvatures, as well as various degrees of brightneſs, may be produced in the projections.

(219.) "From appearances, then, as I obſerved before, we may infer, that the ſun is moſt likely placed in one of the great ſtrata of the fixed ſtars, and very probably not far from the place where ſome ſmaller ſtratum branches out from it. Such a ſuppoſition will ſatisfactorily, and with great ſimplicity, account for all the phænomena of the Milky Way; which, according to this hypotheſis, is no other than the appearance of the projection of the ſtars contained in this ſtratum and its ſecondary branch. As a farther inducement to look on the galaxy in this point of view, let it be conſidered, that we can no longer doubt of its whitiſh appearance ariſing from the mixed luſtre of the numberleſs ſtars that compoſe it. Now, ſhould we ſuppoſe it to be an irregular ring of ſtars, in the centre nearly of which we muſt then ſuppoſe the ſun to be placed, it will appear not a little extraordinary, that the ſun, being a fixed ſtar like thoſe which compoſe this imagined ring, ſhould juſt be in the centre of ſuch a multitude of celeſtial bodies, without any apparent reaſon for this ſingular diſtinction; whereas, on our ſuppoſition, every ſtar in this ſtratum, not very near the termination of its length or height, will be ſo placed as alſo to have its own galaxy, with only ſuch variations in the form and luſtre of it as may ariſe from the particular ſituation of each ſtar."

(220.) A continued ſeries of obſervations confirmed Dr Herſchel in theſe opinions; and in a ſucceeding paper he has given a ſketch of his ideas of the interior conſtruction of the heavens—"That the Milky Way (ſays he) is a moſt extenſive ſtratum of ſtars of various ſizes, admits no longer of the leaſt doubt; and that our ſun is one of the heavenly bodies belonging to it is as evident. I have now viewed and gauged this ſhining zone in almoſt every direction, and find it compoſed of ſhining ſtars, whoſe number, by the account of thoſe gauges, conſtantly increaſes and decreaſes in proportion to its apparent brightneſs to the naked eye."

(221.) "But in order to develop the ideas of the univerſe that have been ſuggeſted by my late obſervations, it will be beſt to take the ſubject from a point of view at a conſiderable diſtance both of ſpace and time. Let us then ſuppoſe numberleſs ſtars of various ſizes ſcattered over an indefinite portion of ſpace, in ſuch a manner as to be almoſt equally diſtributed through the whole. The laws of attraction, which no doubt extend to the remoteſt regions of the fixed ſtars, will operate in ſuch a manner as moſt probably to produce the following remarkable effects.

(222.) "I. It will frequently happen, that a ſtar, being conſiderably larger than its neighbouring ones, will attract them more than they will be attracted by others that are immediately around them; by which means they will be in time, as it were, condenſed about a centre; or, in other words, form themſelves into a cluſter of ſtars of almoſt a globular figure, more or leſs regularly ſo according to the ſize and original diſtance of the ſurrounding ſtars. The perturbations of the mutual attractions muſt undoubtedly be very intricate as we may eaſily comprehend by conſidering what Sir Iſaac Newton has ſaid, (*Princip. lib.* i. *prob.* 58 *et ſeq.*): but in order to apply this great author's reaſoning, of bodies moving in ellipſes, to ſuch as are here for a while ſuppoſed to have no other motion, than what their mutual gravity has imparted to them, we muſt ſuppoſe the conjugate axes of theſe ellipſes indefinitely diminiſhed, whereby the ellipſes will become ſtraight lines.

(223.) "II. The next caſe, which will happen almoſt as frequently as the former, is where a few ſtars, though not ſuperior in ſize to the reſt, may chance to be rather nearer each other than the ſurrounding ones; for here alſo will be formed a prevailing attraction in the combined centre of gravity of them all, which will occaſion the neighbouring ſtars to draw together; not, indeed, ſo as to form a regular globular figure, but, however, a

ſtill

:h a manner as to be condenſed towards the mmon centre of gravity of the whole irregular ıſter. And this conſtruction admits of the ut- ›ſt variety of ſhapes, according to the number d ſituation of the ſtars which firſt gave riſe to : condenſation of the reſt.

(224.) " III. From the compoſition and repeat- conjunction of both the foregoing forms, a rd may be derived, when many large ſtars, or mbined ſmall ones, are ſituated in long extend- regular or crooked rows, hooks, or branches; r they will alſo draw the ſurrounding ones ſo as produce figures of condenſed ſtars coarſely ſi- lar to the former, which gave riſe to theſe con- nſations.

(225.) " IV. We may likewiſe admit of ſtill ore extenſive combinations; when, at the ſame ne that a cluſter of ſtars is forming in one part ſpace, there may be another collecting in a dif- rent, but perhaps not far diſtant, quarter, which ay occaſion a mutual approach towards their ›mmon centre of gravity.

(226.) " V. In the laſt place, as a natural con- quence of the former caſes, there will be great ities or vacancies formed by the retreat of the ars towards the various centres which attract ıem; ſo that, upon the whole, there is evident- a field of the greateſt variety for the mutual nd combined attractions of the heavenly bodies › exert themſelves in.

(227.) " From this theoretical view of the hea- ens, which has been taken from a point not leſs iſtant in time than in ſpace, we will now retreat › our own retired ſtation, in one of the planets ttending a ſtar in its great combination with umberleſs others; and in order to inveſtigate what vill be the appearances from this contracted ſitu- tion, let us begin with the naked eye. The ſtars of the firſt magnitude, being in all probability the ıeareſt, will furniſh us with a ſtep to begin our ſcale. Setting off, therefore, with the diſtance of Sirius or Arcturus, for inſtance, as unity, we will it preſent ſuppoſe, that thoſe of the ſecond mag- nitude are at double, thoſe of the third at treble, he diſtance, &c. Taking it for granted, then, hat a ſtar of the 7th magnitude (the ſmalleſt ſup- poſed viſible with the naked eye) is about 7 times is far as one of the firſt, it follows, that an ob- ſerver who is incloſed in a globular cluſter of ſtars, and not far from the centre, will never be able with the naked eye to ſee to the end of it; for ſince, according to the above eſtimations, he can only extend his view to above 7 times the diſtance of Sirius, it cannot be expected that his eyes ſhould reach the borders of a cluſter which has perhaps not leſs than 50 ſtars in depth every where around him. The whole univerſe to him, there- fore, will be compriſed in a ſet of conſtellations richly ornamented with ſcattered ſtars of all ſizes: Or, if the united brightneſs of a neighbouring cluſter of ſtars ſhould, in a remarkably clear night, reach his ſight, it will put on the appearance of a ſmall, faint, whitiſh, nebulous cloud, not to be perceived without the greateſt attention.

(228.) " Let us ſuppoſe him placed in a much extended ſtratum, or branching cluſter of millions of ſtars, ſuch as may fall under the third form of nebulæ already conſidered. Here alſo the hea- vens will not only be richly ſcattered over with brilliant conſtellations, but a ſhining zone or Milky Way will be perceived to ſurround the whole ſphere of the heavens, owing to the combined light of thoſe ſtars which are too ſmall, that is, too remote to be ſeen. Our obſerver's ſight will be ſo confined, that he will imagine this ſingle col- lection of ſtars, though he does not even perceive the 100odth part of them, to be the whole con- tents of the heavens.

(229.) " Allowing him now the uſe of a com- mon teleſcope, he begins to ſuſpect, that all the milkineſs of the bright path which ſurrounds the ſphere may be owing to ſtars. He perceives a few cluſters of them in various parts of the heavens, and finds alſo that there are a kind of nebulous patches: but ſtill his views are not extended to reach ſo far as to the end of the ſtratum in which he is ſituated; ſo that he looks upon theſe patches as belonging to that ſyſtem, which to him ſeems to comprehend every celeſtial object. He now in- creaſes his power of viſion; and, applying him- ſelf to a cloſe obſervation, finds that the Milky Way is indeed no other than a collection of very ſmall ſtars. He perceives, that thoſe objects which had been called *nebulæ*, are evidently nothing but cluſters of ſtars. Their number increaſes upon him; and when he reſolves one nebula into ſtars, he diſcovers ten new ones which he cannot reſolve. He then forms the idea of immenſe ſtrata of fixed ſtars, of cluſters of ſtars and of nebulæ; till, going on with ſuch intereſting obſervations he now per- ceives, that all theſe appearances muſt naturally a- riſe from the confined ſituation in which we are pla- ced. *Confined* it may juſtly be called, though in no leſs a ſpace than what appeared before to be the whole region of the fixed ſtars, but which now has aſſumed the ſhape of a crookedly branching nebula; not indeed one of the leaſt, but perhaps very far from being the moſt conſiderable, of thoſe numberleſs cluſters that enter into the conſtruction of the heavens."

(230.) Dr HERSCHEL ſhows, that this theoreti- cal view of the heavens is perfectly conſiſtent with facts, and ſeems to be confirmed by a ſeries of obſervations. Many hundreds of nebulæ of the 1ſt and 2d forms are to be ſeen in the heavens; and their places, he ſays, will hereafter be point- ed out; many of the 3d form deſcribed, and in- ſtances of the 4th related; a few of the cavities mentioned in the 5th particulariſed, though many more have been already obſerved: ſo that, " upon the whole (ſays he,) I believe it will be found, that the foregoing theoretical view, with all its conſequential appearances, as ſeen by an eye in- cloſed in one of the nebulæ, is no other than a drawing from nature, wherein the features of the original have been cloſely copied: and I hope the reſemblance will not be called a bad one, when it ſhall be conſidered how very limited muſt be the pencil of an inhabitant of ſo ſmall and retired a portion of an indefinite ſyſtem in attempting the picture of ſo unbounded an extent."

(231.) The doctor having determined that the viſible ſyſtem of nature, by us called the UNIVERSE, conſiſting of all the celeſtial bodies, and many more than can be ſeen by the naked eye, is only a group of ſtars or ſuns with their planets,

conſtituting one of thoſe patches called a *nebula*, and perhaps not one ten thouſandth part of what is really the univerſe, he goes on to delineate the figure of this vaſt nebula, which he is of opinion may now be done; and for this purpoſe, he gives a table, calculating the diſtance of the ſtars which form its extreme boundaries, or the length of the viſual ray in different parts, by the number of ſtars contained in the field of his teleſcope at different times. He then proceeds to offer ſome thoughts on the origin of the nebulous ſtrata of the heavens; in doing which, he gives ſome hints concerning the antiquity of them.

(232.) "If it were poſſible, (ſays he) to diſtinguiſh between the parts of an indefinitely extended whole, the nebula we inhabit might be ſaid to be one that has fewer marks of antiquity than any of the reſt. To explain this idea, perhaps more clearly, we ſhould recollect, that the condenſation of cluſters of ſtars has been aſcribed to a gradual approach; and whoever reflects on the number of ages that muſt have paſſed, before ſome of the cluſters that are to be found in my intended catalogue of them could be ſo far condenſed as we find them at preſent, will not wonder, if I aſcribe a certain air of youth and vigour, to many very regularly ſcattered regions of our ſiderial ſtratum. There are, moreover, many places in it, in which, if we may judge from appearances, there is the greateſt reaſon to believe, that the ſtars are drawing towards ſecondary centres, and will in time ſeparate into cluſters, ſo as to occaſion many ſubdiviſions.

(233.) "Hence we may ſurmiſe, that when a nebulous ſtratum conſiſts chiefly of nebulæ of the firſt and ſecond forms, it probably owes its origin to what may be called the decay of a great compound nebula of the third form; and that the ſubdiviſions which happened to it in length of time, occaſioned all the ſmall nebulæ which ſprung from it to lie in a certain range, according as they were detached from the primary one. In like manner, our ſyſtem after numbers of ages, may very poſſibly become divided, ſo as to give riſe to a ſtratum of two or three hundred nebulæ; for it would not be difficult to point out ſo many beginning or gathering cluſters in it.

(234.) "This throws a conſiderable light, upon that remarkable collection of many hundreds of nebulæ, which are to be ſeen in what I have called the *nebulous ſtratum* in Coma Berenices. It appears from the extended and branching figure of our nebula, that there is room for the decompoſed ſmall nebulæ of a large reduced former great one, to approach nearer to us in the ſides, than in any other parts. Nay, poſſibly there might originally be another very large joining branch, which in time became ſeparated by the condenſation of the ſtars: and this may be the reaſon of the little remaining breadth of our ſyſtem in that very place; for, the nebulæ of the ſtratum of the Coma are brighteſt and moſt crowded, juſt oppoſite to our ſituation, or in the pole of our ſyſtem.

(235.) "As ſoon as this idea was ſuggeſted, I tried alſo the oppoſite pole; where, accordingly, I have met with a great number of nebulæ, tho' under a much more ſcattered form. Some parts of our ſyſtem indeed, ſeem already to have ſuſtained greater ravages of time than others; for inſtance, in the body of the Scorpion, is an opening or hole, which is probably owing to this cauſe. It is at leaſt 4° broad; but its height I have not yet aſcertained. It is remarkable, that the 80 *Nebuleuſe ſans Etoiles* of the *Connoiſſance des Temps*, which is one of the richeſt and moſt compreſſed cluſters of ſmall ſtars I remember to have ſeen, is ſituated juſt on the weſt border of it, and would almoſt authoriſe a ſuſpicion, that the ſtars of which it is compoſed, were collected from that place, and had left the vacancy. What adds not a little to this ſurmiſe, is, that the ſame phænomenon is once more repeated with the fourth cluſter of the *Connoiſſance des Temps*; which is alſo on the weſtern border of another vacancy, and has, moreover, a ſmall miniature cluſter, or eaſily reſolvable nebula, of about 2¼ minutes in diameter north, following it at no very great diſtance.

(236.) "There is a remarkable purity or clearneſs in the heavens, when we look out of our ſtratum at the ſides; that is, towards Leo, Virgo, and Coma Berenices on one hand, and towards Cetus on the other; whereas, the ground of the heavens becomes troubled as we approach towards the length or height of it. Theſe troubled appearances are eaſily to be explained by aſcribing them to ſome of the diſtant ſtraggling ſtars that yield hardly light enough to be diſtinguiſhed.—And I have indeed often experienced this to be the cauſe, by examining the ſpots for a long while together, when at laſt I generally perceived the ſtars which occaſioned them. But, when we look towards the poles of our ſyſtem, where the viſual ray does not graze along the ſide, the ſtraggling ſtars will of courſe be very few in number: and therefore, the ground of the heavens will aſſume that purity which I have always obſerved to take place in thoſe regions."

(237.) Dr HERSCHEL here applies the name of *poles* to thoſe points which are 90° diſtant from a circle paſſing along the Milky Way. The north pole is ſituated in R. Aſ. 186°, and diſtant from the pole of the world 58°.

(238.) According to Herſchel, then, the univerſe conſiſts of *nebulæ*, or innumerable collections of innumerable ſtars, each individual of which, is a ſun not only equal, but much ſuperior to ours; and none of the celeſtial bodies of our nebula are nearer to one another than we are to Sirius, whoſe diſtance is ſuppoſed not to be leſs than 400,000 times that of the ſun from us, or 38 millions of millions of miles. The whole extent of the nebula being in ſome places near 500 times as great, muſt be ſuch, that the light of a ſtar placed at its extreme boundary, ſuppoſing it to fly with the velocity of 12 millions of miles every minute, muſt have taken near 3000 years to reach us. Herſchel, however, is by no means of opinion, that our nebula is the moſt conſiderable in the univerſe.

(239.) "As we are uſed (ſays he) to call the appearances of the heavens, where it is ſurrounded with a bright zone, the *Milky Way*, it may not be amiſs to point out ſome other very remarkable nebulæ, which cannot well be leſs, but are probably

bably much larger than our own ſyſtem; and being alſo extended, the inhabitants of the planets that attend the ſtars which compoſe them, muſt likewiſe perceive the ſame phenomena; for which reaſon they may alſo be called *Milky Ways*, for diſtinction's ſake. My opinion of their ſize is grounded on the following obſervations: There are many round nebulæ of the firſt form, of about five or ſix minutes in diameter, the ſtars of which I can ſee very diſtinctly; and on comparing them with the viſual ray calculated from ſome of my long guages, I ſuppoſe by the appearance of the ſmall ſtars in thoſe gauges, that the centres of theſe round nebulæ may be 600 times the diſtance of Sirius from us."

(240.) He then tells us, that the ſtars in ſuch nebulæ, are probably twice as much condenſed as thoſe of our ſyſtem; otherwiſe, the centre of it would not be leſs than 6000 times the diſtance of Sirius from us; and that it is poſſibly much underrated, by ſuppoſing it only 600 times the diſtance of that ſtar.

(241.) "Some of theſe round nebulæ (ſays Herſchel) have others near them, perfectly ſimilar in form, colour, and the diſtribution of ſtars, but of only half the diameter: and the ſtars in them ſeem to be doubly crowded, and only at about half the diſtance from each other. They are indeed ſo ſmall, as not to be viſible without the utmoſt attention. I ſuppoſe theſe miniature nebulæ to be at double the diſtance of the firſt.

(242.) "An inſtance equally remarkable and inſtructive is, a caſe where, in the neighbourhood of two ſuch nebulæ as have been mentioned, I met with a third ſimilar, reſolvable, but much ſmaller and fainter nebula. The ſtars of it are no longer to be perceived, but a reſemblance of colour with the former two, and its diminiſhed ſize and light, may well permit us to place it at full twice the diſtance of the ſecond, or about four or five times the diſtance of the firſt. And yet the nebuloſity is not of the milky kind; nor is it ſo much as difficultly reſolvable or colourleſs. Now in a few of the extended nebulæ, the light changes gradually, ſo as from the reſolvable to approach to the milky kind; which appears to me an indication, that the milky light of nebulæ is owing to their much greater diſtance. A nebula, therefore, whoſe light is perfectly milky, cannot well be ſuppoſed to be at leſs than 6,000 or 8,000 times the diſtance of Sirius; and though the numbers here aſſumed are not to be taken otherwiſe than as very coarſe eſtimates, yet an extended nebula, which an oblique ſituation, where it is poſſibly fore-ſhortened by one half, two thirds, or three fourths of its length, ſubtends a degree or more in diameter, cannot be otherwiſe than of a wonderful magnitude, and may well outvie our Milky Way in grandeur."

(243.) After giving an account of ſeveral remarkable nebulæ, Dr Herſchel concludes thus: "Now, what great length of time muſt be required to produce theſe effects (the formation of nebulæ) may eaſily be conceived, when, in all probability, our whole ſyſtem, of about 800 ſtars in diameter, if it were ſeen at ſuch a diſtance, that one end of it might aſſume the reſolvable nebuloſity, would not, at the other end, preſent us with the irreſolvable, much leſs with the colourleſs and milky nebuloſities." Great, indeed, muſt be the length of time requiſite for ſuch diſtant bodies to form combinations by the laws of attraction, ſince, according to the diſtances he has aſſumed, the light of ſome of his nebulæ muſt be 36,000 or 48,000 years in arriving from them to us. It would be worth while then to enquire, whether *attraction* is propagated in time or not; or whether it moves quicker or ſlower than light?

(244.) An objection naturally occurred, in the courſe of Herſchel's obſervations and enquiries concerning the ſtructure of the heavens, that if the different ſyſtems were formed by the mutual attractions of the ſtars, the whole would be in danger of deſtruction by the falling of them one upon another. A ſufficient anſwer to this, he thinks, is, that if we can really prove the ſyſtem of the univerſe to be what he has ſaid, there is no doubt but the great Author of it has amply provided for the preſervation of the whole, though it ſhould not appear to us in what manner this is effected.

(245.) Several circumſtances, however, he ſays, manifeſtly tend to a general preſervation. The indefinite extent of the ſideral heavens muſt produce a balance that will effectually ſecure all the great parts of the whole from approaching to each other. "There remains then, (ſays he) only to ſee how the particular ſtars belonging to ſeparate cluſters are prevented from ruſhing on to their centres of attraction." This he ſuppoſes may be done by PROJECTILE FORCES; "the admiſſion of which will prove ſuch a barrier againſt the ſeeming deſtructive power of attraction, as to ſecure from it all the ſtars belonging to a cluſter, if not for ever, at leaſt for millions of ages. Beſides, we ought perhaps to look upon ſuch cluſters, and the deſtruction of a ſtar now and then in ſome thouſands of ages, as the very means by which the whole is preſerved and renewed. Theſe cluſters may be the *laboratories* of the univerſe, wherein the moſt ſalutary remedies for the decay of the whole are prepared."

(246.) The exiſtence of ſuch projectile forces is rendered probable, from the apparent changes of poſition of certain ſtars, and from a compariſon of the beſt modern obſervations with the moſt accurate of former times, there appears to have been a real change in the places of ſome of them. The Bull's Eye, Sirius, and Arcturus, are now found to be half a degree more ſouthern than the ancients reckoned them, and the bright ſtar in the ſhoulder of Orion, has, in Ptolemy, almoſt a whole degree of latitude more ſouthern than at preſent. Dr Herſchel has lately obſerved, that the diſtance and poſition of the two ſtars, forming the double ſtar, r Draconis is different from what it was in Flamſtead's time. So conſiderable is the diſtance, (for it is $16''.6$) that he thinks we can hardly account for it otherwiſe, than by admitting a proper motion in one or other of the ſtars, or in our ſolar ſyſtem; moſt probably, he ſays, neither of the three is at reſt

(247.) If our ſolar ſyſtem do really change its place in abſolute ſpace, in proceſs of time, an apparent change in the angular diſtance of ſome of the fixed ſtars will appear, and the nearer being more

more affected than such as are remote, their relative positions may seem to alter, although the stars were really immoveable, and *vice versa*, we may surmise, from the observed motions of the stars, that our sun, with all its planets and comets, may have a motion towards some particular part of the heavens, on account of a greater quantity of matter collected in a number of stars, and their surrounding planets there situated, which may occasion a gravitation of our whole solar system towards it. On the other hand, if our system be at rest, and any of the stars really in motion, this might likewise vary their apparent position, and the more so, the nearer they are to us, or the swifter their motions are, or the more proper the direction of the motion is to be rendered perceptible by us.

PART II.

OF THE VARIOUS SYSTEMS OF ASTRONOMY.

SECT. I. *Of the* MOST FAMOUS SYSTEMS, *by which the* CELESTIAL PHÆNOMENA *have been* ATTEMPTED *to be* EXPLAINED.

(248.) To explain the motions and appearances of the heavenly bodies, various hypothesis have been formed; and every hypothesis that ever was framed, accounted for some one or other of them; but men being, in the early ages, ignorant of the laws of motion, it could not be expected, that they could discover the true system, or explain all the various phænomena of the celestial orbs.

(249.) In treating of the various systems which have been invented in different ages, we do not mean to give an account of the various absurdities that have been broached by individuals on this subject; but shall confine ourselves to those systems which have been of considerable note, and been generally followed for a number of years. Concerning the opinions of the very first astronomers about the system of nature, we are as ignorant as we are of those astronomers themselves. Whatever opinions are handed down to us, must be of a vastly later date than the introduction of astronomy among mankind.

(250.) If we may hazard a conjecture, however, we are inclined to think, that the first opinions on this subject were much more just, than those that were held afterwards for many years. PYTHAGORAS maintained the motion of the earth, which is now universally believed, but at that time appears to have been the opinion of only a few detached individuals of Greece. As the Greeks borrowed many things from the Egyptians, and Pythagoras had travelled into Egypt and Phenicia, it is probable he might receive an account of this hypothesis from thence; but whether he did so or not, we have now no means of knowing, neither is it of any importance. Certain it is, however, that this opinion did not prevail in his days, nor for many ages afterwards.

(251.) In the 2d century the very name of the Pythagorean hypothesis was suppressed, by a system erected by the famous geographer and astronomer, CLAUDIUS PTOLEMÆUS. This system, which commonly goes by the name of the PTOLEMAIC, he seems not to have originally invented, but adopted as the prevailing one of that age, and perhaps made it somewhat more complex than it was before. He supposed the earth at rest in the centre of the universe. Round the earth and the nearest to it of all the heavenly bodies the moon performed its monthly revolutions. Next to the moon was placed the planet Mercury; then Venus; and above that the Sun, Mars, Jupiter and Saturn, in their proper orbits; then the sphere of the fixed stars; above these, two spheres of what he called *chrystalline* heavens; above these was the primum mobile, which, by turning round once in 24 hours, by some unaccountable means or other carried all the rest along with it. This primum mobile was encompassed by the empyrean heaven, which was a cubic form, and was the seat of the pure and blessed spirits. Besides the motions of all the heavens round the earth once in 24 hours, each planet was supposed to have a particular motion of its own; the moon, for instance, once in a month performed an additional revolution, the sun in a year, &c. See Plate XV. fig. 8.

(252.) It is evident, that on this supposition the confused motions of the planets already described could never be accounted for. Had they circulated uniformly round the earth, their apparent motion ought always to have been equal and uniform, without appearing either stationary or retrograde in any part of their courses. In consequence of this objection, Ptolemy was obliged to invent a great number of circles, interfering with each other, which he called *epicycles* and *excentrics*. These proved a ready and effectual salvo to all the defects of his system; as whenever a planet was deviating from the course it ought or was supposed to have followed, it was then only moving in the epicycle or an eccentric, and would in due time fall into its proper path. As to the natural causes by which the planets were directed to move in these epicycles and eccentrics, it is no wonder that he found himself much at a loss, and was obliged to have recourse to divine power for an explanation, or, in other words, to own that his system was unintelligible. This system continued in vogue till the beginning of the 16th century, when it was superseded by the COPERNICAN, which afterwards.

(253.) The only other systems, worth mentioning, besides the true system, are the *Tychonic*, *Semi-Tychonic*, and the *Cartesian*; all of which gained proselytes, though none of them were ever so universally received as the Ptolemaic and Copernican.

(254.) The TYCHONIC SYSTEM, Plate XV. fig. 9. was invented by TYCHO BRAHE, who supposed the earth absolutely at rest, and that the moon and sun revolved about the earth; the former in a month, and the sun in a year; and at the same time, that the rest of the planets, Mercury, Venus, Mars, Jupiter, and Saturn, revolved round the sun; the three last also encompassing the sun. Besides these motions, he supposed them to have a diurnal motion round the earth, as also all the stars.

(255.) The SEMI-TYCHONIC SYSTEM supposes the planets to revolve round the sun, which with sun and moon revolve about the earth as

centre of motion; and it ſuppoſed the earth to move about its axis from weſt to eaſt in 24 hours. This ſyſtem differs from the Tychonic only in this that it ſuppoſes a diurnal motion in the earth, but, like the Tychonic, denies an annual one.

(256.) The CARTESIAN SYSTEM, ſo named from its author DES CARTES, ſuppoſes a variety of vortices or whirlpools, in which the motions of the heavenly bodies are performed, being carried round the ſun in a vortex of ethereal matter, in different times, proportioned to their diſtances; and each planet having alſo a particular vortex of its own, in which the motions of its ſatellites are performed. From the laws of motion it will eaſily appear, that the irregular motions of the planets cannot be accounted for by theſe vortices; and beſides, the ſuppoſition of an ethereal matter, to perform the operations, is without any foundation, or analogy in nature.

SECT. II. *Of the* COPERNICAN *or* TRUE SYSTEM *of* ASTRONOMY.

(257.) The Ptolemaic ſyſtem had gained univerſal credit, when COPERNICUS began to entertain doubts of its truth; and to try if a more ſatisfactory method, of accounting for the apparent motions of the celeſtial bodies, might not be obtained, than it afforded, He had recourſe to every author upon the ſubject, but obtained no ſatisfaction, till he found from CICERO that NICETAS the Syracuſan had maintained the MOTION OF THE EARTH; and from Plutarch, that Pythagorus and others of the ancients had been of the ſame opinion.

(258.) From theſe ſmall hints, this great genius deduced a moſt complete ſyſtem of aſtronomy, capable of ſolving every phænomenon in a ſatisfactory manner:—a ſyſtem, which has been more and more confirmed, by the diſcoveries and improvements that have been made in aſtronomy and mathematics, ſince his time; as well as by the uſe of teleſcopes, which have diſcovered numerous celeſtial phænomena formerly quite unknown. Like all important diſcoveries, however, when they run counter to general prejudices, the Copernican ſyſtem was at firſt much oppoſed; and by none more than the celebrated Tycho Brahe, who could never aſſent to the motion of the earth, and who invented the ſyſtem deſcribed in laſt ſection, with a view to ſuperſede the neceſſity of it.

(259.) But while philoſophers were divided between the Ptolemaic, the Tychonic, the Carteſian, and Copernician ſyſtems, Sir Iſaac Newton laid down the laws of nature and motion, and, comparing all the phænomena in the heavens, found out the true ſyſtem of the univerſe, confirmed the Copernican ſyſtem of aſtronomy, and demonſtrated by unanſwerable arguments, that it could not poſſibly be otherwiſe, without the utter ſubverſion of all the laws of nature. This ſyſtem founded on the laws of nature, and true mechanical principles, is as follows.

(260.) The ſun is placed nearly in the centre of the orbits of all the planets, and in theſe orbits they move round the ſun, each in its periodic time. See Plate XV. fig 6. The ſun keeps always in or near the ſame place; but has a rotation round its axis from weſt to eaſt in about 25 days. The orbits of all the planets are nearly circular, having the ſun for their centre; but in ſtrictneſs they are ellipſes, having the ſun in the focus of each of them. Theſe orbits are not all in one plane, and yet do not vary a great deal; they interſect one another in lines that paſs thro' the centre of the ſun; the places of the orbits where they interſect are called the *nodes*. All the planets move round the ſun the ſame way, which is from weſt to eaſt, and are called *primary planets*. Their names and order are, Mercury, Venus, the Earth, Mars, Jupiter, Saturn, and Herſchel, or the Georgium Sidus. Four of theſe have others revolving round them, which likewiſe revolve from weſt to eaſt, and are called *ſecondary planets* or *ſatellites*. The Earth has one called the MOON, which revolves in 27¼ days. Jupiter has four, Saturn ſeven, and the Georgium Sidus two. For the characteriſtic marks of the ſun and planets. See Plate XXVIII fig. 11.

(260.) Beſides the planets and their ſatellites, there is another ſort of bodies revolving about the ſun, which only appear at particular times. Theſe are the COMETS, which move either in very long ellipſes, to an immenſe diſtance from the ſun; or in parabolic curves; and then they never return. Theſe move in all manner of directions round the ſun; ſome the ſame way as the planets, and ſome the contrary way; they cut the plane of the earth's orbit in all ſorts of angles, ſome greater and ſome leſs. Some of theſe bodies are ſeveral hundred years in making a revolution; and therefore the periodic times of few of them are known. Nor can their number be determined for want of a proper ſeries of obſervations. There have not been above 80 of theſe bodies obſerved; and of theſe ſome may perhaps be the ſame, coming about again. The whole liſt of comets upon record, that have been noticed, amount to 450, or at moſt 500. They are diſtinguiſhed from other ſtars, by a luminous ſtream of light which they emit, (called the tail,) when they come near the ſun.

(261.) The FIXED STARS are at an immenſe diſtance; for by the niceſt obſervations, they have no annual ſenſible parallax; that is, they appear to the earth when on different ſides of its orbit to be exactly in the ſame places; and the Earth's orbit ſeen from a fixed ſtar, will appear only as a point. Conſequently, the fixed ſtars all ſhine with their own native light: for it would be impoſſible for light, tranſmitted from the ſun to them, ever to be viſible, as it would be infinitely weak at that immenſe diſtance.

(262.) The diſtance of the ſun is immenſely great, in compariſon of that of the moon, altho' it is almoſt nothing in reſpect of that of the fixed ſtars. For the ſun's diurnal parallax, that is, the apparent ſemidiameter of the earth ſeen from the ſun, is ſo ſmall, that no inſtruments could be ſo exactly made as to find it. Hence it is inferred that the ſun's magnitude is vaſtly greater than the earth's. For ſuppoſing the ſun's parallax to amount to as much as a minute, then ſince the apparent diameter of the ſun is half a degree, this would make the ſun's diameter 15 times as big as the earth's; but the ſun's parallax is no ſuch thing,

for

for it is found not to exceed 8″.7. which will make the ſun's diameter 100 times as big as the earth's. That the ſun is of a globular form, is plain from the apparent motion of the ſpots upon its ſurface; for while the ſun moves uniformly about its axis, the ſpots in the middle of the diſk move very quick, but near the edges grow ſlower and ſlower, agreeable to the motion of a globe about its axis. By obſervation of theſe ſpots, the ſun is found to revolve about its axis in 25 or 26 days.

(263.) None of the celeſtial bodies, in our planetary ſyſtem, ſhine with their own native light, except the ſun; ſo that all the planets, both primary and ſecondary are opake bodies, that have no other light but what they receive from the ſun, and reflect it back towards the earth and other planets. This is evident from the moon; for only that ſide of her is obſerved to ſhine which is directly oppoſed to the ſun; but the other ſide which is from the ſun is quite dark, except ſo far as it is illuminated by the reflection from the earth; for the more of the illuminated ſide that is turned towards the earth, the more we ſee her enlightened, the reſt being dark; and the more of her dark ſide that is turned towards the earth, the more of her appears dark. Thus at the full ſhe appears all enlightened, and at her change all dark.

(264.) Mercury and Venus exhibit ſimilar phænomena, and ſhew all the phaſes of the moon according to their various ſituations; and ſometimes appear like a black ſpot upon the body of the ſun. Mars likewiſe appears gibbous when near the quadratures with the ſun. The ſatellites of Jupiter are eclipſed when they are behind his body, being then immerſed in his ſhadow; they likewiſe caſt their ſhadows upon the body of Jupiter. And in Saturn the ſhadow of the ring upon his body proves his opacity. And the weakneſs of the light of thoſe that are far diſtant from the ſun, ſhows that it is not innate but borrowed.

(265.) All the planets are ſpherical, and all or moſt of them have a rotation round their axis. Theſe motions are found by means of certain ſpots upon their ſurfaces, which give us the time of their rotation. For want of ſuch marks, the times of the rotation of ſome planets have not yet been diſcovered. That they are ſpherical bodies appears from the ſlow motion of the ſpots near the edges, and their ſwifter motion near the middle: And the line ſeparating the illuminated part from the dark being always elliptical, proves their figure to be ſpherical.

(266.) SATURN, beſides his ſeven ſatellites, is encompaſſed with a thin concentrical ring, whoſe diameter is more than double his diameter; and whoſe breadth is equal to the hollow ſpace between it and his body. The plane of this ring makes an angle of 31 degrees with the ecliptic, and coincides nearly with the orbits of the ſatellites. This ring revolves in that plane, in the nature of a ſatellite, or rather of a vaſt number of ſatellites, which touch one another, and compoſe the ring. In ſome places of his orbit his ring cannot be ſeen, when its plane paſſes through the earth. In other poſitions it is viſible more or leſs.

(267.) The body of Jupiter is alſo encompaſſed with ſeveral dark lines, called Jupiter's BELTS; which run about his body parallel to his equator. But theſe belts are obſerved not to be permanent, but to increaſe and decreaſe; and undergo ſeveral changes, as do the ſpots upon his ſurface.

(268.) The ſurface of the moon is rough and uneven, and full of innumerable mountains, valleys, and deep pits. This is plain from the line that divides the light from the dark part, for this is always jagged and uneven; the higher parts running more into the dark than the lower. The high mountainous parts caſt a ſhadow to a great diſtance, which gradually grows ſhorter, as the ſun's light comes more perpendicular; and by degrees the light ſhines into the hollows and valleys, and then the ſhadows of the edges gradually diſappear. There are ſeveral ſpots in the moon, ſome brighter, and ſome duller; but no change have ever been obſerved in them, and they keep their places, magnitude and colour. There are ſuppoſed to be no clouds, rain, or water in the moon; for ſhe always has the ſame appearance. There are no rivers, nor ſeas; for ſuch places as are ſmooth, and look moſt like ſeas, are full of ſmall hills and hollows, and the like irregularities; and therefore can contain no water. She always turns the ſame face nearly, towards the earth. The moon is far leſs than any of the planets, and yet appears vaſtly greater, becauſe it is much nearer than any of the reſt.

(269.) The following tables contain a ſynopſis of the periods, diſtances, &c. of the ſun and planets, according to the lateſt and beſt obſervations

(270.) TABLE I.

	Periodiacl revolutions round the ſun.	Proportional mean diſtances from the ſun.	Mean diſtances from the ſemidiameters of the earth.	Mean diſtances from the ſun in Engliſh miles.	Excentricities, or diſtances of the focus from the centre.
	D. H. M.				
MERCURY.	87 23 15½	·3871	9210	37,000,000	7960
VENUS.	224 16 49½	·72333	17210	68,000,000	510
THE EARTH.	365 6 9¼	1·	23799	95,000,000	1680
MARS.	686 23 30⅔	1·52369	36262	144,000,000	14218
JUPITER.	4332 8 51½	5·20098	123778	490,000,000	25277
SATURN.	10761 14 36¼	9·53937	227028	900,000,000	53161
HERSCHEL.	30445 18	19·03421	453000	1800,000,000	4759

TABLE

(271.) TABLE II.

	Greateſt apparent diameter, as ſeen from the earth.	Diameter in Engliſh miles.	Diurnal rotations upon their axes.	Inclinations of their orbits to the ecliptic.	Place of the aſcending node
			D. H. M. S.		S. ° ′
THE SUN.	32′ 36″	883217	25 15 16 0		
MERCURY.	11	3222	unknown.	7° 0′	1 15 46½
VENUS.	58	7687	0 23 22 0	3 23⅓	2 14 44
THE EARTH.		7964	0 23 56 4		
MARS.	25	4189	0 24 39 22	1 51	1 17 59
JUPITER.	46	89170	0 9 56 0	1 19¼	3 8 50
SATURN.	20	79042	0 10 16 0	2 30⅓	3 21 48¼
HERSCHEL.	4	35109	unknown.	0 48	3 13 1

(272.) TABLE III.

	Greateſt elongation of inferior, and parallax of ſuperior planets.	Proportion of light and heat.	Bulk in reſpect to the earth.	Proportion of denſity.	Place of the aphelion.
					S. ° ′
THE SUN.			1380000	¼	
MERCURY.	28° 20′	6·68	$\frac{1}{15}$	2	8 14 13
VENUS.	47 48	1·91	$\frac{9}{15}$	1¼	10 9 38
THE EARTH.		1	1	1	9 9 15¼
MARS.	47 24	·33	$\frac{7}{10}$	$\frac{73}{100}$	5 2 6¼
JUPITER.	11 51	·037	1400	$\frac{231}{100}$	6 10 57½
SATURN.	6 29	·011	1000	$\frac{1}{7}$	9 0 45½
HERSCHEL.	3 4¼	·00276	90	$\frac{11}{10}$	11 23 23

CT. III. *Of* CENTRIPETAL POWERS *in* GENERAL.

(273.) As the doctrine of central forces is of the ateſt importance in the ſcience of aſtronomy, will be proper to explain here, ſome of the moſt terial propoſitions relative to that ſubject.

(274.) In this doctrine, it is ſuppoſed, that matr is equally indifferent to motion or reſt; or that body at reſt never moves itſelf, and that a body motion never changes either the velocity, or rection of its motion, but would move unirmly forward in a ſtraight line for ever, unleſs me external force or reſiſtance ſhould ſtop or ange it.

(275.) Hence when a body at reſt has a tenncy to move, or when a body moving in a aight line, has its velocity continually increaſed diminiſhed, or when the direction of a motion continually changed, and thereby a curve line ſcribed; it is ſuppoſed that theſe circumſtances oceed from the influence of ſome power that ts inceſſantly, which power may be meaſured in e firſt caſe by the preſſure of the quieſcent body ainſt the obſtacle that hinders it from moving; by the change made on the velocity in the 2d ſe; or by the flexure of the cure deſcribed in e 3d caſe; due regard being had to the time in hich theſe effects are produced, and other cirumſtances, according to the principles of mechanics. Now the power or force of GRAVITY produces effects of each of theſe kinds, which fall under our obſervation at the ſurface of the earth, for the ſame power that renders bodies heavy while at reſt, accelerates their motion when they deſcend perpendicularly, and bends the path of their motion into a curve line when they are projected in a direction oblique to that of their gravity. But we can judge of the forces or powers that act on the celeſtial bodies by effects of the laſt kind only, and hence it is that the doctrine of central force is of ſo much uſe in the theory of the planetary motions.

(276.) The following propoſition is the foundation of this doctrine and is given by Sir I. Newton in his Principia. The areas which revolving bodies deſcribe by radii drawn to an immoveable centre of force, lie in the ſame immoveable planes and are proportional to the times in which they are deſcribed. Let the time be ſuppoſed divided into equal parts, and in the firſt part let a body be ſuppoſed, by its own inert force, to deſcribe a right line, AD, PLATE XVI. Fig. 1. From what we have premiſed it will appear, that in the 2d part of time the body would deſcribe the line D B equal to A D if nothing acted upon it. But when the body is come to D, ſuppoſe a centripetal force tending to the point C acts upon it by a ſingle impulſe, ſuch, that it would have carried the body from D to *a* in the ſame time. The body

being now acted upon by two powers, one in the direction D B, and another in the direction D *a* passing through the centre of force, if the parallelogram *a* D B E be completed, the body will move in the diagonal D E, and at the end of the time will be found at E, by the principles of mechanics. Join A C, C E; the triangle A D E, D C B, having equal bases, will therefore be equal, and the triangle C D B, C D E, are equal, for they stand on the same base C D, and lie between the parallels D C, B E, therefore the triangles A C D, D C E are equal. By the same method of reasoning, if in the third particle of time the body describes any other right line EG, it may be proved that the triangle C D E is equal to C E G, and in a fourth particle there will be described a triangle C G I equal to C E G, and so on, it is also obvious that the lines A D, D E, E G, G I, &c. lie in the same plane.

(277.) Thus it appears that in equal times the areas described by radii drawn to the centre of force will be equally increased, and therefore by composition, any sums of the areas are to one another, as the times in which they are described. Let the number of triangles be supposed to be now augmented, and their breadth diminished *in infinitum*, the lines A D, D E, E G, G I, &c. will now become a curve line lying in the same plane, and the centripetal force which was supposed to act by starts, will now act continually, deflecting the body from the tangent, and thus causing it to move in a curve.

(278.) From what has been here shewn, we may infer, that the velocity of a body attracted towards an immoveable centre, in spaces void of resistance is reciprocally as a perpendicular let fall from that centre on the right line that touches the orbit. For draw C Y perpendicular to D E, and suppose the body to describe D E in a given time, hence the velocity of the body will be proportional to D E, and from what has been said, the area of the triangle C E D will be given, for it is proportional to the time, but when the area of a triangle remains the same the base varies inversely as the perpendicular, therefore D E, or the velocity of the body, is inversely as C Y the perpendicular, and the same will hold true, whether the body, by successive impulses, moves in a polygon in the way here described, or by the continual action of the central force, moves in a curve line.

(279.) Sir I. Newton also demonstrates the converse of the preceding proposition, which is, that if a body move in a curve, lying in the same plane, and describe by a radius drawn to a given point, areas proportional to the times; the direction of the power that acts upon the body and bends its way into a curve, is directed to that point. These propositions are general and hold true whatever be the law that regulates the central force and whatever be the direction of the line A B, in which the body is projected; and since these may be indefinitely varied, there is no limit to the varieties of curves that may be described by bodies revolving round a centre of force.

(280.) Having established these general propositions, Sir I. Newton proceeds to inquire what law of centripetal force is necessary to cause a body describe various curve lines, but he particularly confines his attention to the conic sections; for he knew that the planets describe ellipses having the sun in one focus. He investigates, by geometrical reasoning, what forces are proper for causing a body describe various curves, and, in particular, he shews, that if a body describe any conic section, by a force tending to one of its foci, the intensity of the force, acting upon the body at different parts of its orbit, will be inversely as the square of the distance of the body from the centre of force.

(281.) He also shews, that if bodies describe ellipses, or circles, by a force tending to the common foci of the ellipses or centres of the circles, and varying inversely as the squares of the distances of the bodies from the centre of force, the squares of the periodic times of the bodies will be proportional to the cubes of their mean distances from the centre. How these propositions are applied to the planetary motions will be seen in the next section.

Sect. IV. *Of the* Orbits *and* Motions *of the* primary planets.

(282.) Before the time of Kepler, astronomers supposed that the planets moved in circular orbits with uniform motions, and that the sun was not in the centres of the circles, but at some distance from it. But this justly celebrated astronomer instead of taking for granted the truth of the hypothesis of his predecessors, applied himself with diligence, to make observations on the heavenly bodies, and from his great accuracy in the observations, and sagacity in making deductions from them, he has been considered as at the head of the modern reformed astronomy. He also made use of the observations of Tycho Brahe, and, after much labour, and many mistakes, he at last discovered the great laws of the planetary motions, which are hence called Kepler's laws. They are these:

(283.) I. The primary planets and comets describe round the sun, and the secondary planets describe round their respective primary planets, areas proportioned to the times.

(284.) II. The orbits described round the sun, and round the primary planets, are ellipses, having the sun of the primary planet in the focus.

(285.) III. The squares of the periodic times of planets revolving round common centres, are proportional to the cubes of their mean distances.

(286.) These laws were deduced by Kepler entirely from observations, and it is obvious, that they are the very same which Sir Isaac Newton has investigated by geometrical reasoning, as the necessary consequences of a body revolving in an ellipse by a force directed towards one of its foci.

(287.) We are therefore warranted to conclude that the planets are kept in their orbits by a force which is directed to the sun, that the influence of this force extends to the utmost boundaries of the solar system, and we can assign no reason why it may not extend to all distances whatever, observing the same law as the sagacity of Newton has investigated.

(288.) To explain more particularly the orbit of a planet, and the nature of its motion, let A B

and E F be the axis of an ellipſe, of which D is the centre, and C the focus. See Plate XVI. fig. 2. Suppoſe that P is the place of a planet moving in the curve AFBE, (ſupply P in the fig.) and that P G is drawn touching the curve at P. Join C P, C E, and draw C G perpendicular to P G. The place of the ſun will be at C the focus, and the planet will move in the curve; ſo that the line C P ſhall paſs over equal areas in equal times.—Since the velocity of the planet is inverſely as the perpendicular upon the tangent, and the lines CB, CA are perpendicular to tangents at the points B and A, the velocity at B is to the velocity at A, as C A to CB, and the velocity at B is to the velocity at P as CG to CB. Thus at B, which is called the perihelion, the velocity will be the greateſt, and at A the aphelion it will be the leaſt, and at any other point P, it will be between theſe two extremes. The line C E is equal to B D, which is a mean between BC and CA; and when the planet is at E, it is ſaid to be at its *mean diſtance*.—The force, that, acting upon the planet at P, bends it from the tangent, is to the force that acts upon it at E, any other point, as the ſquare of C E to the ſquare of C P.

(289) We have hitherto ſuppoſed the ſun to remain abſolutely at reſt, and that the planet was urged towards it, as to an immoveable point; but Sir I. Newton has ſhewn, that the tendency of the planets towards the ſun, ariſes from a very general law, that not only connects the planets with the ſun, but extends from each individual particle of matter to every other particle of matter in the ſolar ſyſtem; a particular cauſe of this law or fact, is the gravity of bodies at the ſurface of our earth, and the general law that includes all particular caſes, has been termed GRAVITATION. Hence it follows, that not only the planets gravitate toward the ſun, but the ſun gravitates towards the planets; ſo that, in ſtrict truth, both the ſun and each planet revolve round a point, which is their common centre of gravity, and which is as much nearer to the ſun than to the planet, as the ſun contains more matter than the planet.

(290.) The truth of this general law is only to be proved by a careful examination of particular caſes; and, ſuppoſing it to be true, the effects it ought to produce in the planetary motions round the ſun, are in perfect coincidence with the beſt obſervations.

(291.) If all matter gravitates to, or is attracted by all other matter, it is evident that the planets muſt alſo gravitate towards each other; and thus in ſome meaſure the uniformity of their motions round the ſun will be affected. Now this is really found to be the caſe by the moſt accurate obſervations; and the effects produced are preciſely what they ought to be, ſuppoſing that the ſame law, which regulates the tendency of the planets towards the ſun, alſo regulates their tendency to one another.

(292.) If the planets were acted on by a power directed to the centre of the ſun only, varying according to the general law of gravity, and that centre was quieſcent, their motion about it would be perfectly regular; but ſince they are acted on by a power directed to every body of the ſyſtem, in order to judge of the effects of theſe actions, Newton firſt ſuppoſes two bodies revolving about their common centre of gravity, and gravitating towards each other, and ſince the direction of this mutual gravitation paſſes always through that centre, and their diſtances from it vary always in the ſame proportion as their diſtances from each other, it follows, that they muſt deſcribe ſimilar figures about that point and about each other, and deſcribe equal areas in equal times, about that centre, and about each other; ſo that there will be no irregularities in the motion of two bodies about each other, becauſe of their mutual attractions, whatever the law of their gravity is ſuppoſed to be; only they will revolve in leſs time about their centre of gravity, than the one would have done about the other quieſcent, becauſe the orbit deſcribed about the other centre of gravity is leſs than that which is deſcribed by any one of them about the other quieſcent; their diſtance in both caſes being the ſame, and the orbits ſimilar.

(293.) If three or more bodies mutually attract each other, the gravitation of any one of them, ariſing from the attractions of the reſt, may be determined by the rule for compoſition of motion; and if the law of gravity be ſuch as obtains in the ſolar ſyſtem, its gravitations will not be always directed to the centre of gravity of the other bodies, or indeed to any fixed point, but ſometimes to one ſide of that centre and ſometimes to the other, and therefore equal areas will not be deſcribed in equal times about any point in the ſyſtem; and ſome irregularities will therefore ariſe in the motions of the bodies.

(294.) But if one of theſe bodies ſhould be vaſtly greater than the others, ſo that the actions of the other bodies may be neglected, when compared with its action; and the centre of gravity of the ſyſtem be always found near it, the irregularities of ſuch a ſyſtem will be very ſmall, the areas deſcribed in equal times about the centre of the great body will be nearly equal, and the orbits deſcribed will be nearly elliptic, having that centre in their focus. Now this is the caſe of the ſun and planets, and thus we ſee that not only the regular motions of the latter are to be derived from the principle of gravity, but alſo their minute error and irregularities.

(295.) Though the actions of the ſun and of the inferior planets compounded together do not always produce, in a ſuperior planet, a gravitation exactly directed towards their centre of gravity, yet, as, upon the whole, it is more directed to that point, than to any other, the motions of a ſuperior planet will be found more regular, by ſuppoſing that point to be the centre of its attraction, rather than any other; and its ellipſe will be juſt, by placing its lower focus there. A planet, that is higher than this, will, by its attraction, have ſome effect on the motion in this ellipſe; but as it alſo acts on the inferior planets at the ſame time, there will no irregularity ariſe from that part of its action which is equal, and in the ſame direction with them all; but from the differences of its actions only, which being very minute, and having contrary effects in the oppoſite ſituations of that higher planet, can produce effects ſcarcely ſenſible in many revolutions.

(296.) The action of Jupiter on Saturn, when greateſt, (that is when their diſtance is leaſt,) is found by calculation to be $\frac{1}{1067}$ of the action of the ſun upon Saturn. This produces an effect not altogether inſenſible; but the elliptic orb of Saturn will be found to be more juſt, if we ſuppoſe its focus not to be in the centre of the ſun, but in the centre of gravity of Jupiter and the ſun, or rather in the centre of gravity of the ſun and of all the planets below Saturn; and the ſame obſervation applies to the orbit of any other planet.

(297.) The whole action of Jupiter diſturbs the motion of Saturn in their conjunction, becauſe Jupiter then acts upon Saturn and upon the ſun in oppoſite directions. But becauſe Saturn then acts upon Jupiter and upon the ſun in the ſame direction, if it acted alſo with the ſame force on both, it would have no effect on the motion of Jupiter about the ſun; and it is by the exceſs of its action on Jupiter, above its action on the ſun, that it diſturbs the motion of Jupiter. This exceſs is found to be one 1913 part of the action of the ſun on Jupiter; and therefore is much leſs than the force with which Jupiter diſturbs the motion of Saturn.

(298.) The actions of the other planets on each other are incomparably leſs than theſe, and the irregularities proceeding from thoſe actions are always leſs in any planet, as it is nearer the ſun; only the orbit of the earth may appear a little more irregular than its neighbouring planets becauſe it revolves about the centre of gravity of the earth and moon.

(299.) We cannot conclude this ſection without mentioning a reflection of Sir Iſaac Newton upon theſe ſmall irregularities in the motions of the planets; which contains a very ſtrong philoſophical argument againſt the *eternity of the world*. It is this, that theſe inequalities muſt continually increaſe by ſlow degrees, till they at length render the preſent frame of nature unfit for the purpoſes it now ſerves. And a more convincing proof cannot be deſired againſt the preſent conſtitution having exiſted from eternity than this, that a certain period of years will bring it to an end. This thought has been repreſented even as impious, and as no leſs than caſting a reflection upon the wiſdom of the Author of nature for framing a periſhable work. But ſo bold an aſſertion ought to have been made with caution: for if this remark upon the increaſing irregularities in the heavenly motions be true in fact, as it really is, the imputation muſt return upon the aſſerter, that this does not detract from the divine wiſdom.—As we know not all the Creator's purpoſes in making this world, we cannot pretend to determine how long he deſigned it ſhould laſt; and it is ſufficient if it endure the time intended by the Author. The body of every animal ſhows the unlimited wiſdom of the Author no leſs, nay, in many reſpects more, than the larger frame of nature; and yet we ſee they are all deſigned to laſt but a ſmall ſpace of time. And revelation aſſures us, that this world is not intended to laſt for ever.

Sect. V. *Of the* Orbits *and* Motions *of the* Secondary Planets.

(300.) The ſame general principle of gravitation by which the motions of the primary planets are produced, and they made to move round the ſun as a centre; extends alſo to the motions of the ſecondary planets, both in regard to their motion round the ſun along with their primaries, and to their motions round their primaries as a centre; and from obſervations on the ſecondary planets we get an additional proof of this general law, that all matter gravitates to all other matter with a force reciprocally proportional to the ſquare of the diſtance.

(301.) That each ſecondary planet is kept in its orbit by a power directed toward its primary, &c. is proved from the phænomena of the ſatellites of Jupiter and Saturn; becauſe they move in circles, as far as we can obſerve, about their reſpective primaries with an equal courſe, the primary being the centre of each orbit: and by comparing the times in which the different ſatellites of the ſame primary perform their periods, they are found to obſerve the ſame relation to the diſtances from their primary, as the primary planets obſerve in reſpect of their mean diſtances from the ſun. The ſame thing holds good alſo with regard to the earth and moon; for ſhe is found to move round the earth in an ellipſis after the ſame manner as the primary planets do about the ſun, excepting only ſome ſmall irregularities in her motions, the cauſe of which will be particularly explained in what follows; and it will appear that they are no objections againſt the earth's acting on the moon in the ſame manner as the ſun acts on the primary planets; that is, as Jupiter and Saturn act upon their ſatellites.

(302.) The power of Jupiter and Saturn may be meaſured to a very conſiderable diſtance, by the number of ſatellites which move round them: for the diſtance of the outermoſt ſatellite of each of them exceeds ſeveral times that of the innermoſt. The force of the earth upon the moon, however, at different diſtances, is more confirmed by the following conſideration than any analogical reaſoning. It will appear, that if the power of the earth by which it retains the moon in her orbit, be ſuppoſed to act at all diſtances between the earth and moon, according to the rule already mentioned, this power will be ſufficient to produce upon bodies near the ſurface of the earth all the effects aſcribed to the principle of gravity. This is diſcovered by the following method.

(303.) Let A in Plate XV. fig. 10. repreſent the earth, B the moon, BCD the moon's orbit: which differs little from a circle of which A is the centre. If the moon in B were left to itſelf to move with the velocity it has in the point B, it would leave the orbit, and proceed ſtraight forward in the line BE which touches the orbit in B. Suppoſe the moon would upon this condition move from B to E in the ſpace of one minute of time: by the action of the earth upon the moon, whereby it is retained in its orbit, the moon will really be found at the end of this minute in the point F, from whence a ſtraight line drawn to A ſhall make the ſpace BFA in the circle equal to the triangular ſpace BEA; ſo that the moon, in the time wherein it would have moved from B to E, if left to itſelf, has been impelled towards the earth from E to F. And when the time of

e moon's paſſing from B to F is ſmall, as here is only one minute, the diſtance between E and ſcarce differs, from the ſpace through which e moon would deſcend in the ſame time, if it re to fall directly down from B toward A with- t any other motion. A B, the diſtance of the on from the earth, is about 60 of the ſemidia- ters of the latter; and the moon completes her olution round the earth in about 27 days 7 rs and 43 minutes: therefore the ſpace E F l here be found by computation to be about feet. Conſequently, if the power, by which moon is retained in its orbit, be, near the ſur- e of the earth, greater than at the diſtance of moon, in the duplicate proportion of that diſ- ce, the number of feet a body would deſcend r the ſurface of the earth, by the action of this wer upon it, in one minute, would be equal to number $16\frac{1}{12}$ multiplied twice into the number ; that is, to 58050.

304.) How faſt bodies fall near the ſurface of the th may be known by the pendulum; and by exact periments, they are found to deſcend the ſpace $16\frac{1}{12}$ feet in one ſecond; and the ſpaces deſcri- l by falling bodies being in the duplicate pro- tion of the times of their fall, the number of t a body would deſcribe in its fall near the ſur- e of the earth in one minute of time, would equal to $16\frac{1}{12}$ twice multiplied by 60; the ſame the power which acts upon the moon would ıſe.

305.) The earth, in this computation, is ſup- ed to be at reſt; but it would have been more ıl to ſuppoſe it to move, as well as the moon, ut their common centre of gravity. The ac- n of the ſun upon the moon is alſo here neglec- ; and Newton ſhews, if you take in both theſe ıſiderations, the preſent computation will beſt ee to a ſomewhat greater diſtance of the moon l earth, viz. to $60\frac{1}{2}$ ſemidiameters of the latter, ich diſtance is more conformable to aſtronomi- obſervations; and theſe computations afford additional proof that the action of the earth ſerves the ſame proportion to the diſtance which ıere contended for.

306.) Hence it follows, that the power which ains the moon in her orbit is the ſame as that ich cauſes bodies near the ſurface of the earth gravitate; for ſince the power by which th acts on the moon will cauſe bodies near ſurface of it to deſcend with all the ve- ity they are found to do, it is certain no ıer power can act upon them beſides; be- ıſe, if it did, they muſt of neceſſity deſcend ſter; and it is at length very evident, that the wer in the earth which we call *gravity* extends to the moon, and decreaſes in the duplicate ɔportion of the increaſe of the diſtance from earth. If to the motion of the ſatellite where- it would be carried round its primary at reſt, ſuperadd the ſame motion, both in regard the velocity and direction, as the primary itſelf ı, it will deſcribe about the primary the ſame ɔit with as great regularity as if the primary l been indeed at reſt. This proceeds from the ı of motion, which makes a body near the ſur- e of the earth deſcend perpendicularly, tho' the th be in a ſwift motion, that if the falling body did not partake of it, its deſcent would be oblique.

(307.) From this we learn, that if the ſatellite moved about its primary with perfect regularity, beſides its motion about the primary it would have the ſame progreſſive velocity with which the primary is carried about the ſun, in a direc- tion parallel to that impulſe of its primary. And, on the contrary, the want of either of theſe, in particular of the impulſe towards the ſun, will occaſion great inequalities in the motion of the ſe- condary planet. The inequalities which would ariſe from the abſence of this impulſe towards the ſun are ſo great, that by the regularity which ap- pears in the motion of the ſecondary planets, it is proved, that the ſun communicates to them the ſame velocity by its action as it gives to their pri- mary at the ſame diſtance. Newton informs us, that upon examination he found, that if any of the ſatellites of Jupiter were attracted by the ſun more or leſs than Jupiter himſelf at the ſame diſ- tance, the orbit of that ſatellite, inſtead of being concentrical to Jupiter, would have its centre at a greater or leſs diſtance than the centre of Jupiter from the ſun, nearly in the ſubduplicate propor- tion of the difference between the ſun's action u- pon the ſatellite and upon Jupiter. Therefore, if any ſatellite were attracted by the ſun but 100dth part more or leſs than Jupiter is at the ſame diſ- tance, the orbit of that ſatellite would be diſtant from the centre of Jupiter no leſs than a 5th part of the outermoſt ſatellite from Jupiter; which is almoſt the whole diſtance of the innermoſt ſatellite. By the like argument, the ſatellites of Saturn gravi- tate towards the ſun as much as Saturn itſelf at the ſame diſtance, and the moon as much as the earth.

(308.) The ſun therefore acts upon the ſecon- dary planets as much as upon the primaries at the ſame diſtance: but the action of the ſun upon bodies is reciprocally in the duplicate proportion of the diſtance; therefore the ſecondary planets being ſometimes nearer to the ſun than to the primary, and ſometimes more remote, they are not always acted upon in the ſame degree with their primary, but when nearer to the ſun are attracted more, and when farther off are attracted leſs. Hence a- riſe various inequalities in the motions of the ſe- condary planets. Some of theſe inequalities, how- ever, would take place, though the moon, if un- diſturbed by the ſun, had moved in a circle con- centrical to the earth, and in the plane of the earth's motion; others depend on the elliptical figure and oblique ſituation of the moon's orbit. One of the former is, that the moon does not de- ſcribe equal ſpaces in equal times, but is continu- ally accelerated as ſhe paſſes from the quarter to the new or full, and is retarded again by the like degrees in returning from the new and full to the next quarter; but here we conſider not ſo much the abſolute as the apparent motions of the moon with reſpect to us.

(309.) Theſe two may be diſtinguiſhed in the following manner. Let S, in *Plate* XVI. *fig.* 3. repreſent the ſun, A, the earth moving in its orbit B C, D E F G the moon's orbit, and H the place of the moon in her orbit. Suppoſe the earth to have moved from A to I. Becauſe it has been ſhown that the moon partakes of all the progreſ- ſive motion of the earth, and likewiſe that the ſun attracts

attracts both the earth and moon equally when they are at the same distance from it, or that the mean action of the sun upon the moon is equal to its action upon the earth; we must therefore consider the earth as carrying about with it the moon's orbit: so that when the earth is removed from A to I, the moon's orbit shall likewise be removed from its former situation into that denoted by K L M N. But now the earth being in I, if the moon were found in O, so that O I should be parallel to H A, though the moon would really have moved from H to O, yet it would not have appeared to a spectator upon the earth to have moved at all, because the earth has moved as much; so that the moon would still appear in the same place with respect to the fixed stars. But if the moon be observed in P, it will then appear to have moved, its apparent motion being measured by the angle O I P. And if the angle P I S be less than the angle H A S, the moon will have approached nearer its conjunction with the sun. Now, to explain particularly the inequality of the moon's motion already mentioned, let S, in *fig.* 4. represent the sun, A the earth, B C D E the moon's orbit, C the place of the moon when in the latter quarter. Here it will be nearly at the same distance from the sun as the earth is. In this case, therefore, they will be both equally attracted, the earth in the direction A S, and the moon in that of C S. Whence, as the earth, in moving round the sun, is continually descending towards it, so the moon in this situation must in any equal portion of time descend as much; and therefore the position of the line A C in respect of A S, and the change which the moon's motion produces in the angle C A S, will not be altered by the sun: but as soon as the moon is advanced from the quarter toward the new or conjunction, suppose to G, the action of the sun upon it will have a different effect. Were the sun's action upon the moon here to be applied in the direction G H parallel to A S, if its action on the moon were equal to its action on the earth, no change would be wrought by the sun on the apparent motion of the moon round the earth. But the moon receiving a greater impulse in G than the earth receives in A, were the sun to act in the direction G H, yet it would accelerate the description of the space D A G, and cause the angle G A D to decrease faster than it otherwise would. The sun's action will have this effect upon account of the obliquity of its direction to that in which the earth attracts the moon. For the moon by this means is drawn by two forces oblique to one another: one drawing from G towards A, the other from G towards H; therefore the moon must necessarily be impelled towards D

(310.) Again, because the sun does not act in the direction G H parallel to S A, but in the direction G S oblique to it, the sun's action on the moon will, by reason of this obliquity, farther contribute to the moon's acceleration. Suppose the earth, in any short space of time, would have moved from A to I, if not attracted by the sun, the point I being in the straight line C E, which touches the earth's orbit in A. Suppose the moon in the same time would have moved in her orbit from G to K, and besides have partook of all the progressive motion of the earth. Then, if K L be drawn parallel to A I, (the line K L must be supplied in the figure) and taken equal to it, the moon, if not attracted to the sun, would be found in L. But the earth, by the sun's action, is removed from I. Suppose it were moved down to M in the line I M N parallel to S A, and if the moon were attracted but as much, and in the same direction as the earth is here supposed to be attracted, so as to have descended during the same time in the line L O parallel also to A S, down as far as P, till L P were equal to I M, let P M be joined, the angle P M N will be equal to L I N; that is, the moon will appear advanced as much farther forward as if neither it nor the earth had been subject to the sun's action.

(311.) But this is on the supposition that the actions of the sun upon the earth and moon are equal; whereas the moon being acted upon more than the earth, did the sun's action draw the moon in the line L O parallel to A S, it would draw it down so far as to make L P greater than I M, whereby the angle P M N will be rendered less than L I N. But, as the sun draws the earth in a direction oblique to I N, the earth will be found in its orbit, somewhat short of the point M. However, the moon is attracted by the sun, still more out of the line L O, than the earth is out of the line I N; therefore, this obliquity of the sun's action will yet farther diminish the angle under P M N. Thus, the moon, at the point G, receives an impulse from the sun, whereby her motion is accelerated; and the sun producing this effect in every place, between the quarter and the conjunction, the moon will move from the quarter, with a motion continually more and more accelerated: and therefore, by acquiring, from time to time, an additional degree of velocity in its orbit, the spaces which are described in equal times by the line drawn from the earth to the moon, will not be every where equal, but those toward the conjunction, will be greater than those toward the quarter. But, in the moon's passage, from the conjunction D, to the next quarter, the sun's action, will again retard the moon, till, at the next quarter at E, it be restored to the first velocity which it had in C.

(312.) When the moon moves from E to the full, or opposition to the sun in B, it is again accelerated; the deficiency of the sun's action on the moon from what it has upon the earth, producing here the same effect as before the excess of its action. Let us now consider the moon in Q, as moving from E towards B. Here, if she were attracted by the sun, in a direction parallel to A S, yet being acted on less than the earth, as the latter descends towards the sun, the moon will in some measure be left behind. Therefore, R F being drawn parallel to S B, a spectator would see the moon move as if attracted from the point Q in the direction R F, with a degree of force equal to that whereby the sun's action on the moon falls short of its action on the earth. But the obliquity of the sun's action has here also an effect. In the time the earth would have moved from A to I, without the influence of the sun, let the moon have moved in its orbit from Q to R. Drawing, therefore, R T parallel to A I, the moon, by the

motion of its orbit, if not attracted by the ſun, muſt be found in T; and therefore, if attracted in a direction parallel to SA, would be in the line TV parallel to AS: ſuppoſe in W. But the moon in Q being farther off the ſun than the earth, it will be leſs attracted; that is, TW will be leſs than IM; and if the line NM be prolonged towards X, the angle XMW will be leſs than XIT.

(313.) Thus, by the ſun's action, the moon's paſſage from the quarter to the full would be accelerated, if the ſun were to act on the earth and moon in a direction parallel to AS; and the obliquity of the ſun's action will ſtill increaſe this acceleration: for the action of the ſun on the moon is oblique to the line SA, the whole time of the moon's paſſage from Q to T, and will carry her out of the line TV towards the earth. Here we ſuppoſe the time of the moon's paſſage from Q to T ſo ſhort, that it ſhall not paſs beyond the line SA. The earth will alſo come a little ſhort of the line IN, as was already mentioned; and from theſe cauſes the angle XMW will be ſtill farther leſſened. The moon, in paſſing from the oppoſition B to the next quarter, will be retarded again by the ſame degrees as it was accelerated before its appulſe to the oppoſition; and thus the moon, by the ſun's action upon it, is twice accelerated, and twice reſtored to its firſt velocity every circuit it makes round the earth; and this inequality of the moon's motion about the earth is called by aſtronomers its variation.

(314.) A ſecond effect of the ſun upon the moon is, that it gives the orbit of the latter in the quarters, a greater degree of curvature than it would receive from the earth alone; and, on the contrary, in the conjunction and oppoſition the orbit is leſs inflected. When the moon is in the conjunction with the ſun at D, the latter attracting her more forcibly than it does the earth, the moon is by that means impelled leſs to the earth than otherwiſe it would be, and thus the orbit leſs incurvated; again, when the moon is in the oppoſition in B, farther removed from the ſun than the earth is, though the earth and moon are both drawn by the ſun towards itſelf out of the place they would otherwiſe move into, yet the moon deſcends with leſs velocity than the earth: inſomuch that, in any given ſpace of time from its paſſing the point of oppoſition, it will have leſs approached the earth than otherwiſe it would have done; that is, its orbit, in reſpect to the earth, will approach nearer to a ſtraight line.—When the moon is in the quarter in C, and equally diſtant from the ſun as the earth, it was before obſerved, that they would both deſcend with equal velocity towards the ſun, ſo as to make no change in the angle CAS; but the length of the line CA muſt neceſſarily be ſhortened.—Therefore, the moon, in moving from C toward the conjunction with the ſun, will be impelled more toward the earth by the ſun's action, than it would have been by the earth alone, if neither the earth nor the moon had been acted upon by the ſun; ſo that, by this additional impulſe, the orbit is rendered more curve, than it otherwiſe ſhould be. The ſame effect will alſo be produced in the other quarter.

(315.) A third effect of the ſun's action is, that though the moon, undiſturbed by the ſun, might move in a circle, having the earth for its centre, by the ſun's action, if the earth were to be in the very middle or centre of the moon's orbit, the moon would be nearer the earth at the new and full, than in the quarters. This may at firſt appear ſomewhat difficult to be underſtood, that the moon ſhould come neareſt to the earth where it is leaſt attracted by it: yet, upon a little conſideration, it will evidently appear to flow from that very cauſe, becauſe her orbit, in the conjunction and oppoſition, is rendered leſs curve; for the leſs curve the orbit is, the leſs will the moon have deſcended from the place it would move into without the action of the earth.

(316.) If the moon were to move from any place without further diſturbance from that action, ſince it would proceed on the line touching the orbit in that place, it would continually recede from the earth; and therefore, if the power of the earth upon the moon be ſufficient to retain it at the ſame diſtance, this diminution of that power will cauſe the diſtance to increaſe, though in a leſs degree. But, on the other hand, in the quarters, the moon being preſſed in a leſs degree towards the earth, than by the earth's ſingle action, will be made to approach it; ſo that, in paſſing from the conjunction or oppoſition to the quarters, the moon aſcends from the earth; and in paſſing from the quarters to the oppoſition or conjunction, it deſcends again, becoming nearer to theſe laſt mentioned places than in the other. All theſe inequalities differ in degree as the ſun is more or leſs diſtant from the earth; being greateſt when the earth is in its perihelion, and ſmalleſt when it is in its aphelion: for in the quarters, the nearer the moon is to the ſun, the greater is the addition to the earth's action upon it by the power of the ſun, and in the conjunction and oppoſition, the difference between the ſun's action upon the earth, and upon the moon, is likewiſe ſo much the greater.

(317.) This difference, in the diſtance between the earth and the ſun, produces a further effect upon the moon's motion; cauſing her orbit to dilate when leſs remote from the ſun, and become greater than when at a farther diſtance. Newton has proved, that the action of the ſun, by which it diminiſhes the earth's power over the moon in the conjunction or oppoſition, is about twice as great as the addition to the earth's action by the ſun in the quarters; ſo that, upon the whole, the power of the earth on the moon is diminiſhed by the ſun; and therefore, is moſt diminiſhed, when that action is ſtrongeſt. But, as the earth, by its approach to the ſun, has its influence leſſened, the moon, being leſs attracted, will gradually recede from the earth; and as the earth, in its receſs from the ſun, recovers by degrees its former power, the orbit of the moon muſt again contract.

(318.) Two conſequences follow from hence, viz. that the moon will be more remote from the earth, when the latter is neareſt the ſun, and will take up a longer time in performing its revolution through the dilated orbit, than through the more contracted. Theſe irregularities would be produced, if the moon, without being acted upon unequally by the ſun, ſhould deſcribe a perfect

circle

circle about the earth, and in the plane of its motion; but, though neither of these circumstances take place, yet the above mentioned inequalities occur only with some little variation with regard to the degree of them: but some others are observed to take place from the moon's motion being performed in the manner already described. For, as the moon describes an ellipsis, having the earth in one of its foci, this curve will be subjected to various changes, neither preserving constantly the same figure nor position; and, because the plane of this ellipsis is not the same with that of the earth's orbit, it follows, that the former will continually change; so that neither the inclination of the two planes towards each other, nor the line in which they intersect, will remain for any length of time unaltered.

(319.) The various forces, by which the motion of the moon is disturbed, and the changes which take place in its orbit, may be investigated in the following manner. See *Plate* XVI. *Fig.* 5. Let CABD be the moon's orbit, T the earth, S the sun, P the moon; make SK = ST; and let SK : SL :: SP^3 : SK^3. Then if SK or ST represent the sun's force at T, SL will represent his force at P. Draw LM parallel to PT; divide the force LS into the two forces LM acting parallel to PT, and MS acting parallel to TS. But the force LM, and the part TM disturb the moon's motion.—The force LM in its mean quantity is equal to PT, and by so much the force of the earth is increased. Also TM in its mean quantity is equal to 3PK, acting in a direction PN parallel and equal to TS; and the force MT draws the moon out of her orbit. Let P, p, be the periodical times of the earth and moon; then the sun's centripetal force at T (ST) : the earth's centripetal force at P :: $\frac{ST}{PP} : \frac{PT}{pp}$; therefore the earth's centripetal force at P = $\frac{PT \times PP}{pp}$. And this is to the additional force PT : $\frac{PT \times PP}{pp}$ :: PT :: PP : pp. That is, the force by which the moon is retained in her orbit : is to the increase of centripetal force by the sun's action :: PP : pp :: 178·725 : 1.—Therefore the increase of the moon's centripetal force is $\frac{1}{178 \cdot 725}$ of that force.

(320.) Also force PT : force 3PK or PL :: PT : 3PK. Therefore, ex æquo, the force by which the moon is retained in her orbit : disturbing force PL or TM :: PT × 178·725 : 3PK. Therefore the disturbing force TM = $\frac{3PK}{PT \times 178 \cdot 725}$ × earth's centripetal force on the moon = $3a$ the sine of the moon's distance from the quadratures × earth's centripetal force, divided by 178·725 × radius.

Let C, c, *be the centripetal forces of the sun and earth,* s = *sine of the moon's distance from the quadrature, radius* = r. *Then the additional force* (PT) = $\frac{c}{178 \cdot 725}$. *And the disturbing force* (TM) = $\frac{3sc}{178 \cdot 752r}$.

Produce TP, *and make* PR = PL *or* TM, *and draw* RQ *perpendicular to* TQ. *Then* QR *is the force that accelerates the moon, and* PQ *is the diminution of its centripetal force.*

For the force PR is divided into two forces, PQ, and QR, of which PQ acting towards Q diminishes the moon's centripetal force; and QR being parallel to the tangent at P, accelerates the moon at P.

(321.) *There are therefore four points in the moon's orbit, each* 35° 16′ *from the quadratures, where the moon's disturbing force makes no alteration in the earth's central force.*

For the triangles PKT and PQR are similar, whence PK : PT :: PQ (PT) : PR (3PK); therefore $3PK^2 = PT^2$, or $3ss = rr$, whence $s = \sqrt{\frac{rr}{3}}$ = S. 35° 16′. And when PQ = PT, the diminution of the force is equal to the addition, which makes no alteration.

The mean force PT *is* = $\frac{1}{6434 \cdot 10}$ *of the force of gravity of the earth.*

For the force of gravity is 3600 times greater than the force at P.

The whole increase of the centripetal force at P *is* $\frac{c}{178 \cdot 725} \times \left(1 - \frac{3ss}{rr}\right)$

For rad (r) : s :: PT $\left(\frac{c}{178 \cdot 725}\right)$: PK = $\frac{cs}{178 \cdot 725r}$. And PR = 3PK = $\frac{3cs}{178 \cdot 725r}$. And rad ($r$) : PR $\left(\frac{3cs}{178 \cdot 725r}\right)$ :: S.R (r) : PQ = $\frac{3css}{178 \cdot 725rr}$. And PT — PQ = whole additional force = $\frac{1 - \frac{3ss}{rr}}{178 \cdot 725} c$.

If A = *sine of twice the moon's distance from the quadratures; then the force* QR, *accelerating or retarding the moon's motion in its orbit, is* $\frac{3c}{178 \cdot 725} \times \frac{A}{2r}$.

Let z = S.QPR or KPT = cos. PTK; then rad (r) : RP $\left(\frac{3cs}{178 \cdot 725r}\right)$ :: S.QPR (z) : QR = $\frac{3c}{178 \cdot 725rr} \times sz$ = (by trigonometry) $\frac{3c}{178 \cdot 725} \times \frac{A}{2r}$.

(322.) *Hence the moon is accelerated in the quadrants* CA, DB; *and retarded in the quadrants* AD, BC; *and the force which accelerates or retards the moon's motion, is greatest in the octants.*

For

For it is greateſt when A is greateſt, that is ıen 2CP is 90 degrees, or CP = 45°.

The diſturbing force TM, *in the ſyzıges* A *and* B, 2PT. *And therefore the earth's force upon the ıon in the ſyzıges, is twice as much diminiſhed, as is increaſed in the quadratures.*

The moon's orbit is more flat in the ſyzıges, and ıre curve in the quadratures; and therefore ſhe s farther from the earth in the quadratures.

For the orbit will be more curve where the cen- l force is greater, that is in the quadratures.

(323.) *The motion of the moon's nodes, ſuppoſing r orbit to be nearly circular, may be thus found.*

Fig. 6. Let AqBQ be the moon's orbit, T the rth, P the moon, SAB the line of the apſides, q the quadratures, mNn the line of the nodes. ζ, PH, AZ perpendiculars upon TQ and Nn. ıe force by which the moon is drawn out of her

bit has been found to be $\frac{3s}{178.725r}\ c =$

$\frac{s}{59.575r}\ c$. Let PM be the arch which the moon ſcribes in any ſmall time; and ML a ſmall line, ıich the moon deſcribes in the ſame time by the

rce $\frac{s}{59.575r}\ c$, as this force is directed to the n, the line ML will be parallel to TA. As ML the diſtance that the moon is drawn from the ch PM, by the ſaid accelerative force; 2ML ll be the uniform motion it has acquired in that ne, by the ſaid force. Let MP be continued ck to *m*, in the moon's orbit, to cut the line the nodes TN in *m*. Now ſince ML is paral- to the ecliptic; a plane drawn through ML d MP*m*, will cut the ecliptic in a line *ml*, which ill be parallel to ML; therefore draw LP*l* to t *ml* in *l*, and the triangles PML and P*ml* are ſi-

ilar, and therefore $ml = \frac{mP \times ML}{MP}$; but ſince P is given, and ML is as the force 3PK, there- re *ml* is as *m*P × PK. Now when the moon as at P, the line of the nodes was at T*m*, where e plane of the moon's orbit TMP cuts the e- iptic. But when the moon comes to L (inſtead M,) the plane of her orbit will then be in the ane TLP; and the line of the nodes at T*l*, where e plane TLP*l* cuts the eclpitic. Therefore the ıgular motion of the nodes generated in that ne will be = angle *m*T*l*. But the angle *m*T*l* is

$\frac{ml}{Tm}$ × ſine of T*ml* or ATN; that is, as

$\frac{P \times PK}{mT} \times AZ$; that is, becauſe by ſimilar

iangles $\frac{mP}{mP} = \frac{PH}{PT}$ as $\frac{PH \times PK}{PT} \times AZ$,

ıat is, (becauſe PT is given) as PH × PK × AZ. The line ML is to the verſed ſine of the arch M, as the forces that produce them; that is, as

$\frac{s}{59.575r}\ c$ to *c*, or as *s* to 59.575*r*. That is ML: $\frac{PM^2}{2MT} :: s : 59.575r$; therefore $ML = \frac{PM^2}{2MT} \cdot \frac{s}{59.575r}$. When P falls upon A, or the moon is in the ſyzigy; then *s* = *r*, and the angle PML is a right angle: therefore in the triangle PML, PM:

$ML\left(\frac{PM^2}{2MT \times 59.575}\right) :: \text{radius} : \text{S.LPM or } mPl = \frac{PM}{2MT \times 59.575}$. And if N be at Q, or the nodes in the quadratures, and P at A; then PM and PL being parallel to the ecliptic, *m* and *l* will be at an infinite diſtance, and then the angle *m*T*l* will be equal to *mPl*, whoſe ſine is

$\frac{PM}{2MT \times 59.575}$. And the angle *m*T*l* anſwering to 2ML is the motion of the node, whoſe ſine is

$\frac{PM}{MT \times 59.575}$. Suppoſe PM to be deſcribed in an hour, then PM or the mean horary motion is 31′ 56″½, whoſe ſine, as it differs inſenſibly from the arch, we ſhall have the arch = $\frac{32'\ 56''\frac{1}{2}}{59.575}$ (putting PM = 1) = 33″. 18, where all the angles PTK, PTN and STN are right angles. And in other caſes, the horary motion of the node will be to 33″. 18, as the product of the ſines of the three angles PTK, PTN and STN, to the radius cube; and the nodes are regreſſive when all the ſines are poſitive. But if any ſine changes to be negative, the nodes will be progreſſive.

(324.) *Hence the nodes are progreſſive, when the moon is between either quadrature, and the node neareſt that quadrature; otherwiſe they are regreſſive. And by the exceſs of the regreſs above the progreſs, they are in the whole moved forward.*

For in the arches QA*n* and *q*BN, PK and PH are both affirmative or both negative. And in the arches NQ, *nq*, only one is negative, the other being affirmative.

(325.) If it were not for the ſun's perturbating force, the moon would always deſcribe the ſame ellipſis, and the tranſverſe axis and excentricity of the orbit would remain unaltered. But ſince the perturbating force of the ſun always acts upon her more or leſs, and cauſes all the irregularities of her motion; it is evident that all theſe effects will be the greater as that force is the greater. But when the tranſverſe axis or line of the apſides is in the ſyziges, then the perturbate force TM or 3 PK, fig. 5. is the greateſt poſſible, by which the moon is removed farther from the earth, and conſequently the tranſverſe axis is lengtheped, and the excentricity becomes greater. And the contrary happen when the tranſverſe is in the quadratures, for by its being in the quadratures, the force LM is greater; and the whole centripetal force towards T being greater, the body will be drawn nearer the earth and deſcribe a leſs orbit, or one leſs excentric than before. Therefore when the apſides are in the quadratures, the excentricity

is leſs; and when they are in the ſyziges, it is greater. But how much it is greater or leſs depends upon the mean excentricity; and that depends upon obſervation.

(326.) *Hence the excentricity continually increaſes, as the apſides move from the quadratures to the ſyziges; and decreaſes from the ſyziges to the quadratures. And the excentricity of the orbit continually increaſes, as the moon paſſes from the quadratures to the ſyziges; and decreaſes, in paſſing from the ſyziges to the quadratures.* For the perturbating force increaſes from the quadratures to the ſyziges, and decreaſes from the ſyziges to the quadratures.

SECT. VI. *Of the* NATURE *and* MOTIONS *of* COMETS.

(327.) It is certain that COMETS are not meteors in our air, becauſe they riſe and ſet in the ſame manner as the moon and ſtars. The aſtronomers had gone ſo far in their inquiries concerning them, as to prove by their obſervations that they moved in the celeſtial ſpaces beyond the moon; but they had no notion of the path which they deſcribed. Now the power of the ſun being reciprocally in the duplicate proportion of the diſtance, every body acted upon by him muſt either fall directly down or move about him in one of the conic ſections, viz. either the ellipſes, parabola, or hyperbola. If a body which deſcends towards the ſun as low as the orbit of any planet, move with a ſwifter motion than the planet, it will deſcribe an orbit of a more oblong figure than that of the planet, and have at leaſt a longer axis. The velocity of the body may be ſo great, that it ſhall move in a parabola, ſo that having once paſſed the ſun, it ſhall aſcend for ever without returning, tho' the ſun will ſtill continue in the focus of that parabola; and with a velocity ſtill greater, they will move in a hyperbola It is, however, moſt probable, that the comets move in very excentric ellipſes; and hence thoſe bodies are ſometimes found at a moderate diſtance from the ſun, and appear within the planetary regions; at other times they aſcend to vaſt diſtances, far beyond the orbit of Saturn, and become inviſible.

(328.) That the comets do move in this manner is proved from computations built upon the obſervations made by many aſtronomers. Theſe computations were made by Sir Iſaac Newton upon the comet which appeared toward the end of 1680 and beginning of 1681, and were proſecuted more at large by Dr Halley upon this and other comets. They depend on this principle, that the excentricity of the orbits of the comet is ſo great, that if they are really elliptical, yet that part of them which comes under our view approaches ſo near to a parabola that they may be taken for ſuch without any ſenſible error.

(329.) Sir ISAAC teaches a method of finding the parabola in which any comet moves, by three obſervations made upon it in that part of its orbit where it agrees neareſt with a parabola; and this theory is confirmed by aſtronomical obſervations; for the places of the comets may thus be computed as exactly as thoſe of the primary planets. He alſo ſhows how to make uſe of any ſmall deviation from the parabola which may be ob... to determine whether the orbits of the comet... elliptical or not; and thus to know whether... ſame comet returns at different ſeaſons. D... mining by this rule the comet of 1680, he ... its orbit to agree more exactly with an ellipſis ... a parabola, though the ellipſis be ſo very ex... that it cannot perform its revolution in 500 ... On this Dr Halley obſerved, that mention was ... in hiſtory of a comet with a ſimilar large ... which appeared three ſeveral times before ... firſt was before the death of Julius Cæſar; ... each appearance happened at the interval ... years, the laſt coinciding with the year 1682. ... therefore calculated the motion of this comet ... be in ſuch an excentric orbit, that it could ... return in leſs than 575 years; which compared ... agree yet more perfectly with the obſervations ... made on this comet than any parabola can ... will do.

(330.) To compare together different appearances of the ſame comet, is indeed the only method of diſcovering with certainty the form of its orbit; for it is impoſſible to diſcover the form of one ſo exceedingly excentric from obſervations taken in a ſmall part of it. Sir Iſaac Newton therefore propoſes to compare the orbits, on the ſuppoſition that they are parabolical, of ſuch comets as appear at different times; for if we find the ſame orbit deſcribed by a comet at different times, in all probability it will be the ſame comet that deſcribes it. Here he remarks from Dr Halley, that the ſame orbit very nearly agrees to two appearances of a comet about the ſpace of 75 years diſtance; ſo that if theſe two appearances were really of the ſame comet, the tranſverſe axis of its orbit would be 18 times that of the axis of the earth's orbit; and therefore, when at its greateſt diſtance from the ſun, this comet would be removed not leſs than 35 times the mean diſtance of the earth from the ſame luminary. Even the leaſt diſtance aſſigned to any comet in its recteſt elongation from the ſun; and on the foundation of Dr Halley's computations it was expected in the year 1758 or 1759.

(331.) Sir ISSAC NEWTON remarks, that as ſo great excentricity of the orbits of comets renders them very liable to be diſturbed by the attraction of the planets and other comets, it is probable to prevent too great diſturbances from theſe cauſes, while all the planets revolve nearly in the ſame plane, the comets are diſpoſed in very different ones and diſpoſed all over the heavens; that when in their greateſt diſtance from the ſun, and moſt ſloweſt, they might be removed as far as poſſible out of the reach of each others action. The ſame end is likewiſe anſwered in thoſe comets, which by moving ſloweſt in the aphelion or remoteſt diſtance from the ſun, deſcended neareſt to the ſun, placing their aphelion at the greateſt height from the ſun. See PART I. SECT. III. 130—134. and SECT. IV.

SECT. VII. *of the* BODIES *of the* SUN *and* PLANETS, *the* QUANTITY *of* MATTER *they contain, and their* DENSITIES.

(332.) The primary planets and comets being

tained in their orbits by a power directed towards e ſun and the ſecondaries being alſo retained by a nilar power directed to the centre of the prima-s, the ſame power is diffuſed through their hole ſubſtance, and inherent in every particle. his is proved by ſhewing that each of the heaven- bodies attracts the reſt, and other bodies, with ch different degrees of force, as that the force of e ſame attracting body is exerted on others, ex-ly in proportion to the quantity of matter con-ined in the body attracted.

(333.) The firſt proof of this is from the experi-ents made on bodies on our earth. Pendulums brate by the ſame power which makes heavy odies fall to the ground; but if the ball of any endulum of the ſame length with another were ore or leſs attracted in proportion to the quan-ty of ſolid matter it contains, that pendulum uſt then vibrate faſter or ſlower than the other. low the vibrations of pendulums continue for a ng time, and the number of vibrations they make ay be eaſily determined without any ſuſpicion f error; and Newton aſſures us, that he examined veral ſubſtances, as gold, ſilver, lead, glaſs, nd, common ſalt, wood, water, and wheat; l all which he found not the leaſt deviation from ne theory, though he made the experiment in ch a manner, that in bodies of the ſame weight, difference in the quantity of their matter leſs han the thouſandth part of the whole would have iſcovered itſelf.

(334.) It appears, therefore, that all bodies are ade to deſcend here by the power of gravity ith the ſame degree of ſwiftneſs. This deſcent as been determined at 16¼ feet in a ſecond from he beginning of their fall. If any terreſtrial body ould be conveyed as high up as the moon, it ould deſcend with the very ſame degree of ve-ocity with which the moon is attracted towards the arth; and therefore the power of the earth upon he moon bears the ſame proportion it would have pon thoſe bodies at the ſame diſtance as the quan-ity of matter in the moon bears to the quantity in hoſe bodies. Thus the aſſertion is proved in the arth, and its power on every body it attracts is, t the ſame diſtance from the earth, proportional o the quantity of ſolid matter in the body acted pon.

(335. As to the ſun, the power of his action pon the ſame primary planet is reciprocally in he duplicate proportion of its diſtance; and that is power decreaſes throughout in the ſame pro-portion, is teſtified by the motion of the planets raverſing the whole planetary region. This proves hat if any planet was removed from the ſun to ny diſtance whatever, the degree of its accelera-ion towards the ſun would yet be reciprocally n the duplicate proportion of their diſtance. But he degree of acceleration given to the planets by he ſun is reciprocally in the duplicate proportion of their reſpective diſtances; all which, compared together, puts it out of doubt, that the power of the ſun upon any planet removed into the place of any other, would give it the ſame velocity of deſcent as it gives that other; and conſequently that the ſun's action upon different planets at the ſame diſtance would be proportionable to the quantity of matter in each. The ſun attracts the primary planets and their reſpective ſecondaries, when at the ſame diſtance, in ſuch a manner as to communicate to both the ſame degree of velo-city; and therefore the force wherewith the ſun acts on the ſecondary planet bears the ſame pro-portion to the force wherewith it attracts the pri-mary, as the quantity of matter in the ſecondary planet bears to the quantity of matter in the pri-mary.

(336.) This property therefore is found in the ſun with regard to both kinds of planets; ſo that he poſſeſſes the ſame quality found in the earth, viz. that of acting on bodies with a degree of force proportional to the quantity of matter they contain. This point being granted, it is hardly to be ſuppoſed that the power of attraction with which the other planets are endowed, ſhould be different from that of the earth, if we conſider the ſimilitude of theſe bodies; and hence it follows, that this attraction extends itſelf to every particle of matter in the at-tracted body, and that no portion of matter is exempted from the influence of theſe bodies to which this attractive power has been proved to belong.

(337.) In a word the attractive power both of the ſun and planets appears to be the ſame in all; for it acts in each in the ſame proportion to the diſtance, and in the ſame manner acts alike upon every particle of matter. This power, therefore, in the ſun and planets, is not of a different nature from the power of gravity in the earth: and this enables us to prove, that the attracting power lodged in the ſun and planets belongs likewiſe to every part of them; and that their reſpective pow-ers upon the ſame body are proportional to the quantity of matter of which they are compoſed; for inſtance, that the force with which the earth at-tracts the moon, is to the force with which the ſun would attract it at the ſame diſtance, as the quantity of ſolid matter in the earth is to that in the ſun.

(338.) The rule that action is equal to re-action, holds good in the attractive powers as well as in any other. The moſt remarkable force of this kind with which we are acquainted, next to that of gravity, is the attraction the loadſtone has for iron. Now if a loadſtone and piece of iron were both made to ſwim on water, both of them would move towards each other, and thus the attraction would be ſhown to be mutual; and when they meet, they will mutually ſtop each other; which ſhews that their velocities are reciprocally propor-tioned to the quantities of ſolid matter in each; and that by the ſtone's attracting the iron, it re-ceives as much motion itſelf, in the ſtrict philoſo-phic ſenſe of the word, as it communicates to the iron: for it is proved from experiments on the percuſſion of bodies, that if two meet with velo-cities reciprocally proportioned to their reſpective bodies, they will be ſtopped by the concourſe, un-leſs they met with ſome other velocity, or their elaſticity put them into freſh motion.

(339.) From this mutual action of the ſun and planets upon each other, it follows, as has been already mentioned, that they both revolve about their common centre of gravity. Thus let A (in Plate XVI. fig. 7.) repreſent the ſun, B a planet, and C their common centre of gravity. If theſe

bodies were once at reſt, they would directly approach each other by their mutual attraction, and that with ſuch velocities, that their common centre of gravity would remain at reſt, and they would meet in that point. Were the planet B to receive an impulſe, as in the direction BE, this would prevent the two bodies from falling together; but their common centre of gravity would be put into motion in the direction of the line CF, parallel to BE. In this caſe, the ſun and planet would deſcribe round their common centre of gravity ſimilar orbits, while that centre would proceed with an uniform velocity in the line CF, and ſo the ſyſtem of the two bodies would move on with the centre of gravity without end. In order to keep the ſyſtem in the ſame place, it is neceſſary, that when the planet received its impulſe in the direction BE, the ſun ſhould receive ſuch another the contrary way, ſo as to keep the centre of gravity: C without any motion, in which caſe it would always remain fixed.

(340.) The action, therefore, between the ſun and planets is mutual. The power which acts between the ſun and primary planets is altogether of the ſame nature with that which acts between the ſecondary planets and their primaries, or which acts between the earth and bodies near its ſurface. In different planets the force of the ſun's action upon each at the ſame diſtance, would be proportional to the quantity of ſolid matter contained in the planet: therefore the reaction of the planet on the ſun at the ſame diſtance, or the motion which he would receive from each planet, would alſo be proportional to the quantity of matter in the planet; that is, theſe planets, at the ſame diſtance, would act on the ſame body, with the degrees of ſtrength proportioned to the quantity of ſolid matter contained in each.

(341.) From theſe principles, Newton has proved that each of the particles out of which the ſun, moon, and planets are formed, exert their power of gravitation by the ſame law, and in the ſame proportion to the diſtance, as the great bodies they compoſe. For this purpoſe, he firſt demonſtrates, that if the globe were compounded of particles which will attract the particles of any other body reciprocally in the duplicate proportion of their diſtances, the whole globe will attract the ſame in the reciprocal duplicate proportion of their diſtances from the centre of the globe, provided it be of equal denſity throughout; and if a globe acts upon diſtant bodies by the law juſt now ſpecified, and the power of the globe be derived from its being compoſed of attracting particles, each of theſe will attract after the ſame proportion. For the globe is ſuppoſed to act upon the particles of a body without it conſtantly in the reciprocal duplicate proportion of their diſtances from the centre; and therefore, at the ſame diſtance from the globe, on which ſide ſoever the body be placed, the globe will act equally upon it.

(342.) Now, if the particles, of which the globe is compoſed, acted upon thoſe without in the reciprocal duplicate proportion of their diſtances, the whole globe would act upon them in the ſame manner as it does; if the particles of the globe have not all of them that property, ſome muſt act ſtronger than in that proportion, whilſt others act weaker; and if this be the condition of the globe, it is plain, that when the body attracted is in ſuch a ſituation in reſpect of the globe, that the greater number of the ſtrongeſt particles are neareſt to it, the body will be more forcibly attracted than when, by turning the globe about, the greater quantity of weak particles ſhould be neareſt, though the diſtance of the body ſhould remain the ſame from the centre of the globe; which is contrary to what was at firſt remarked; that the globe acts equally on all ſides. If all the particles of the globe attract all the particles of another in the proportion already mentioned, the attracting globe will act upon the other in the ſame proportion to the diſtance between the centre of the globe which attracts, and the centre of that which is attracted: and the proportion holds true, though either or both of the globes be compoſed of diſſimilar parts, ſome rarer, and ſome more denſe; provided only, that all the parts of the ſame globe, equally diſtant from the centre, be homogenous, and likewiſe if both globes attract each other.

(343.) Sir Iſaac has thus ſhown, that this power in the great bodies of the univerſe is derived from the ſame being lodged in every particle of the matter which compoſes them; and conſequently that it is no leſs than univerſal in matter, though the power be too minute to produce any viſible effects on the ſmall bodies with which we are converſant, by their action on one another. In the fixed ſtars indeed we have no particular proof that they have this power, as we find no appearance to demonſtrate that they either act or are acted upon by it. But ſince this power is found to belong to all bodies whereon we can make obſervation, and we find that it is not to be altered by any change in the ſhape of bodies, but accompanies them in every form without diminution, remaining ever proportional to the quantity of ſolid matter in each; ſuch a power muſt, without doubt, univerſally belong to matter.

(344.) From the times in which theſe ſatellites perform their revolutions, compared with their diſtances from their reſpective primaries, the proportion between the power with which one primary attracts his ſatellites, and the force with which any other attracts his, will be known; and the proportion of the power with which any planet attracts his ſecondary to the power with which it attracts a body at its ſurface, is found by comparing the diſtance of the ſecondary planet from the centre of the primary to the diſtance of the primary planet's ſurface from the ſame; and from hence is deduced the proportion between the power of gravity upon the ſurface of one planet to the gravity upon the ſurface of another.

(345.) By the like method of comparing the periodical time of a primary planet about the ſun, with the revolution of a ſatellite about its primary, may be found the proportion of gravity, or of the weight of any body, on the ſurface of the ſun, to the gravity or to the weight of the ſame body upon the ſurface of the planet which carries about the ſatellite. By computations of this kind, ſo

tronomers have found the relative denſities of the ſun and ſuch planets as have ſatellites, together with their quantities of matter and the ſpace through which a heavy body would fall in 1 ſecond at their ſurfaces. The reſult of theſe calculations may be arranged as in the following table:

	Quant. of Matter.	Denſity.	Fall of a body in 1 ſecond. In Feet.
Sun	338343	100	450·9
Earth	1	395	16·09
Jupiter	317·1	98	41·64
Saturn	86·16	69	14·4
Herſchel	18	22	18·66

(346.) From all this we may draw the following concluſions, viz. That the ſun is rarefied by its great heat; and that of the 4 planets above-mentioned, the moſt denſe is that neareſt the ſun.—The denſities of the planets Mars, Venus, and Mercury, as they are not attended with ſatellites on which obſervations may be made, cannot be aſcertained. From analogy, however, we ought to conclude, that the inferior planets, Venus and Mercury, are more denſe than the earth, and Mars more rare.

PART III.

EXPLANATION OF THE CELESTIAL PHÆNOMENA, ACCORDING TO THE NEWTONIAN DOCTRINE.

SECT. I. *Of the* CIRCLES, NODES, ASPECTS, CONJUNCTIONS, &c. *of the* PLANETS.

(347.) To a ſpectator placed in the ſun, all the planets would appear to deſcribe circles annually in the heavens: for though their motions are really elliptical, the eccentricity is ſo ſmall, that the difference between them and true circles is not eaſily perceived even on earth; and at the ſun, whether great or ſmall, it would entirely vaniſh. Theſe circles, which in ſuch a ſituation would appear to be annually deſcribed among the fixed ſtars, are called the *heliocentric circles* of the planets. To a ſpectator in the ſun, the comets, though moving in the moſt eccentric orbits, would alſo appear to deſcribe circles in the heavens: for though their orbits are in reality very long ellipſes, the planes of them extended to the heavens would mark a great circle of which the eye would be the centre; only, as the real motion is in an ellipſis, the body would appear to move much more ſlowly in ſome part of the circle than another, and to differ exceſſively in magnitude.

(348.) To an inhabitant of any planet, however, the ſun appears to go round in its own heliocentric circle, or to deſcribe in the heavens that ſame curve, which the planet would appear to do if ſeen from the ſun. Thus in *Plate* XVI. *fig.* 8. when the earth is at *a*, if we draw a line from *a* through the ſun at S, the point G, in the ſphere of the heavens where the line terminates, is the place where the ſun then appears to an inhabitant of the earth. In a month's time the earth will go from *a* to *b*; draw a line then through the ſun, and its extremity at H will point out his apparent place at that time. In like manner if we draw lines from the earth in 12 ſeveral ſituations in which it is repreſented for the 12 months of the year, the ſun's apparent place will be found as above; and ſo it would be found by a ſpectator placed in Venus or any other planet.

(349.) The heliocentric circle of the earth is called the ECLIPTIC; becauſe eclipſes of the ſun or moon can only happen when the latter is in or near it. By ſome ancient writers it has been called the circle of the ſun, or the oblique circle, becauſe it cuts the equator at oblique angles. It is alſo called by Ptolemy the circle which paſſes through the midſt of the animals; becauſe the 12 conſtellations, through which it paſſes, were anciently all repreſented by animals, or parts of them, though now the *balance* is introduced in place of the claws of the *ſcorpion*. For this reaſon, a belt taken in the concave ſphere of the heavens about 10 degrees on each ſide of the ecliptic, is called the ZODIAC, from Ζωον, an animal, and the conſtellations through which the ecliptic is drawn, are called the conſtellations of the zodiac.

(350.) Although the ſun apparently goes round the earth annually in this circle, we cannot determine his place by mere inſpection, as we can do that of any other heavenly body; for the fixed ſtars are the only marks by which we can determine the place of any of the celeſtial bodies; and the ſuperior brightneſs of the ſun renders them totally inviſible, except in the time of a great eclipſe, when his light is for a time totally obſcured. But though we cannot know the place of the ſun directly, it is eaſily found from a knowledge of thoſe fixed ſtars which are oppoſite to him.

(351.) Thus, in *Plate* XVI. *fig.* 8. ſuppoſe it the time of the year in which the earth is at *g*, if we know that the point G is then diametrically oppoſite to the ſun, we know that A, its oppoſite, is the ſun's place, and conſequently, by finding the places throughout the year diametrically oppoſite to the ſun, as G H I K L M A B C D E F, we may be aſſured that in theſe times the ſun's place was in the points A B C D E F G H I K L M. The point in the heavens diametrically oppoſite to the ſun may be known every night at 12 o'clock when the ſtars are viſible; for the ſtar which has an elevation above the horizon, at that time equal to the ſun's depreſſion below it, is directly oppoſite to him.

(352.) When the ECLIPTIC is thus found, the latitude of the moon or any ſtar is counted by its diſtance from the ecliptic, in the ſame manner as the latitudes of places on the earth are reckoned by their diſtance from the equator, and circles paſſing thro' the poles of the ecliptic at right angles to its plane, are called *circles of latitude*. The DECLINATION of any celeſtial body is its deviation from the equator towards the pole neareſt to it.

(353.) The LATITUDE of any planet is either *heliocentric* or *geocentric*. The *heliocentric latitude* is its diſtance from the ecliptic as ſeen from the ſun, and its *geocentric* as ſeen from the earth. As the orbits of the planets are inclined in different angles to the ecliptic, the heliocentric latitude of any planet, is almoſt always different from its geocentric latitude. Thus, let A B, *Plate* XVI. *fig.*

9. be the orbit of the earth, C D the orbit of Venus, viewed with the eye in their common ſection, wherein they appear ſtraight lines; let E and F be two oppoſite points of the ecliptic; and ſuppoſe Venus to be in the point C. If ſhe were at that time viewed from the ſun S, ſhe would appear in the point of the heavens marked H, and her heliocentric latitude is then F H; but if viewed from the earth in B, ſhe will appear at *g*; and her geocentric is only F *g*.

(354.) The planets Mercury and Venus, whoſe orbits are included in that of the earth, are called INFERIOR; and Mars, Jupiter, Saturn, and the Georgium Sidus, are called SUPERIOR PLANETS. The two points where the heliocentric circle of any planet cuts the ecliptic, are called its NODES; and that which the planet paſſes through as it goes into north latitude, is called the *aſcending* node, and is marked thus ☊; and the oppoſite to this is called the *deſcending* node, and is marked ☋. A line drawn from one node to the other is called the *line of the nodes of the planet*, which is the common ſection of the plane of the ecliptic, and that of the planet produced on each ſide to the fixed ſtars.

(355.) The zodiac is either ASTRAL or LOCAL. The aſtral is divided into 12 unequal parts, becauſe it contains 12 celeſtial conſtellations, ſome of which are larger than others. The local zodiac is divided into 12 equal parts, called SIGNS, each containing 30 degrees. Theſe are counted from the point where the equator and ecliptic interſect each other at the time of the vernal equinox; and are denoted by particular marks, according to the apparent annual motion of the ſun. See *Plate* XVI. *fig.* 10. A motion in the heavens in the order of theſe ſigns, as from Aries to Taurus, is ſaid to be a motion in *conſequence*; and ſuch are the true motions of all the planets, though their apparent motions are ſometimes contrary, and then they are ſaid to move in *antecedence*. The local zodiac is not always invariably the ſame as to the places of the ſeveral ſigns, though the whole always takes up the ſame place in the heavens, viz. 10 degrees on each ſide the ecliptic. The points where the celeſtial equator cuts the ecliptic, are found to have a motion in antecedence of about 50 ſeconds a year.

(356.) This change of place of the firſt point of the ecliptic, from whence the ſigns are counted, occaſions a like change in the ſigns themſelves; which, though ſcarce ſenſible for a few years, has now become very conſiderable. Thus, ſince aſtronomy was firſt cultivated among the Greeks, which is about 2000 years ago, the firſt point of the ecliptic is removed backward above a whole ſign: and though it was then about the middle of the conſtellation Aries, is now about the middle of Piſces. Notwithſtanding this alteration, however, the ſigns ſtill retain their ancient names and marks. When the zodiac is mentioned by aſtronomers, the local zodiac is generally meant.

(357.) The LONGITUDE of a phænomenon in the heavens is in the number of degrees counted from the firſt point of Aries on the ecliptic to the place where a circle of latitude drawn through the phænomenon would cut the ecliptic at right angles. Every phænomenon in the heavens, whether in the zodiac or not, is thus referred to the ecliptic by its circle of latitude, or great circle, paſſing through the phænomenon, and cutting the ecliptic at right angles; and whatever ſign the circle of latitude paſſes through, the phænomenon is ſaid to have its place in that ſign, though ever ſo far diſtant from it.

(358.) Some aſtronomers make the local zodiac invariable; for which purpoſe they imagine a circle of latitude drawn through the firſt ſtar of the conſtellation Aries, marked in Bayer's catalogue by the Greek letter γ; and reckon their longitude from the point where that circle cuts the ecliptic. This ſtar, is called the firſt ſtar of the Ram; and when this method is made uſe of, the longitude of any phænomenon is ſaid to be ſo many ſigns, degrees, minutes, &c. from the firſt ſtar of the Ram. Thus, in Street's Caroline Tables, the longitude of Jupiter's aſcending node is two ſigns eight degrees from the firſt ſtar of Aries, which is thus marked: Lon. ☊ ☊ *a* 1° ♈ 2° 8°. The common way of reckoning the longitude of a phænomenon is to take ♈ for the firſt point of the ecliptic, and not to number the degrees quite round that circle as a continued ſeries, but to make a new beginning at the firſt point of every ſign, and to reckon from thence only the length of 30°. When this method is made uſe of, the longitude of any phænomenon is expreſſed by ſaying it is in ſuch a degree and ſuch a minute of a ſign: and thus we may expreſs the longitude of the aſcending node of Mercury, ☿ ☊ ♉ 13° 40'; and ſo of any other. The place of a phænomenon in the heavens is expreſſed by ſetting down its longitude and latitude.

(359.) Every planet like the moon, is ſometimes in CONJUNCTION with the ſun, and ſometimes in OPPOSITION. Its conjunction is when the geocentric place of the planet is the ſame with that of the ſun; though an exact or central conjunction can only take place when the line of its nodes paſſes through the earth, and the planet itſelf is in one of its nodes at the time. It is however, in general, called a conjunction or oppoſition, when the ſame circle of latitude paſſes through the ſun and planet at the ſame time. When the geocentric place of a planet is 90°, or a quarter of a circle from the ſun's place, the planet is ſaid to be in *quadrature* or in a *quartile* aſpect with the ſun; and theſe terms are uſed in a like ſenſe when applied to any two of the heavenly bodies. Thus the ſun and moon, or the moon and any planet, or any two planets, may be in conjunction, oppoſition, or quadrature.

(360.) Beſides theſe, the ancients reckoned two other aſpects, the TRINE and the SEXTILE; the former when the bodies were diſtant 120°, and the latter when only half that diſtance. Theſe aſpects are marked thus:

Conjunct.	Oppoſition.	Quadrature.	Trine.	Sextile.
☌	☍	□	△	⚹

The aſpects were formerly ſuppoſed to influence the affairs of mankind; but ASTROLOGY, which treated of theſe influences, is now juſtly rejected.

(361.) The inferior planets have two kinds of conjunction with the ſun; one in the inferior part of their ſemicircles, the other in the ſuperior part. In the former, the planet is between the earth and

and the ſun; and in the latter, the ſun is between the earth and planet. The inferior planets can never be in oppoſition to the ſun, nor even appear at a great diſtance from him. The length they go is called their *elongation*. Thus, in PLATE XVI. fig. 11. let O P Q R T be part of the ecliptic; S the ſun; and the three circles round him, the orbits of Mercury, Venus, and the Earth. Suppoſe the earth to be at A, the ſun's geocentric place will be at Q. If Mercury be then at I, his geocentric place is likewiſe at Q; ſo that he is in conjunction with the ſun in his inferior ſemicircle: if at M, his geocentric place is likewiſe at Q; ſo that he is in conjunction in his ſuperior ſemicircle.

(362.) In like manner, Venus at E is in conjunction in her inferior ſemicircle, at G in her ſuperior: but if we ſuppoſe the earth to be at A, and Venus at H, her geocentric place is T, and her elongation Q T, which in this figure is the greateſt poſſible; for this always takes place when a ſtraight line from the earth touches the orbit of the planet, as is evident from the figure; that is, provided the planet be in its aphelion at the time. Thus the greateſt poſſible elongation of Mercury is Q P when he is in his aphelion at L; and the quantity of this is found by aſtronomical obſervations to be about 28 degrees, and that of Venus about 48. The inferior planets in their elongations, are ſometimes eaſtward and ſometimes weſtward of the ſun; in the former caſe they appear in the evening, and in the latter in the morning. The ſmallneſs of Mercury and his nearneſs to the ſun prevent him from being often taken notice of; but the largeneſs and beauty of Venus have made her, in all ages, celebrated as the *evening* and *morning ſtar*.

(363.) The planets ſometimes appear to go forward, ſometimes backward, and ſometimes to ſtand ſtill. Theſe different conditions are by aſtronomers called *direct*, *retrograde*, and *ſtationary*. Were they to be viewed from the ſun, they would always appear direct; but when viewed from the earth, the inferior planets appear direct while moving in their upper ſemicircles, and retrograde when in their lower ones. Thus in fig. 11. ſuppoſe the earth at reſt at A, while Mercury is going on in his orbit from N to I, and from I to L, his motion appears to an obſerver at A to be retrograde, or contrary to the order of the ſigns, namely from R to Q and from Q to P; but when in that part of his orbit which lies between L and N, his motion appears direct, or from P to Q and from Q to R.

(364.) When the earth is in the line of nodes of an inferior planet, the apparent motion of the former is then in a ſtraight line, becauſe the plane of it paſſes through the eye: if in a conjunction in his upper ſemicircle, he paſſes behind the ſun: if in his lower ſemicircle, he paſſes before it, and will then be ſeen by an obſerver on earth to paſs over the ſun's diſk like a round and very black pot. Were the plane of his orbit coincident with the ecliptic, this appearance would be ſeen every year; but by reaſon of the obliquity of the two planes to each other, it is much more rare.

(365.) MERCURY, however, was ſeen in this manner November 12th 1782, at 3 h 44′ in the afternoon; May 4th, 1786, at 6 h. 57′ in the morning; and December 6th, 1789, at 3 h. 55′ in the afternoon; but was not ſeen again, in this iſland at leaſt, until the year 1799, May 7th, at 2 h. 34′ in the afternoon. In like manner, VENUS ſometimes appears as a black ſpot on the ſun, but more ſeldom than Mercury. She was thus ſeen firſt in 1639; afterwards in the years 1761 and 1769; but will not again be viſible in this manner till the year 1874.

(366.) When the earth is out of the line of the nodes of an inferior planet, its orbit appears an ellipſis, more or leſs eccentric, according to the ſituation of the eye of the ſpectator. In theſe caſes, the motion of Mercury is unequal: faſter near the inferior conjunction, but moſt unequal in the inferior ſemicircle, going through the unequal ſpaces into which the ellipſis is divided. The motions of the inferior planets, both direct and retrograde, are very unequal; and this inequality proceeds not from the excentricity of their orbits, but from the projection of their orbits into long ellipſes, and is therefore a mere optical deception.

(367.) Theſe planets appear ſtationary while changing their motion from direct to retrograde, or from retrograde to direct. If the earth ſtood ſtill, the times of their appearing ſtationary would be at their greateſt elongation; for though it be a property of the circle, that a ſtraight line can only touch it in one point, yet when the circle is very large, the receſs from the tangent is not perceptible for a conſiderable time. Thus in fig. 11. ſuppoſe the earth to be at reſt in A, Venus would appear ſtationary, her geocentric place continuing at T all the while ſhe is going in her orbit from *a* to *b*; becauſe her deviation from the viſual line A T would ſcarce be perceptible ſo near the point of contact H.

(368.) The inferior planets, therefore, to an inhabitant of the earth, appear always near the ſun; alternately going from and returning to him, ſometimes in ſtraight lines, at others in elliptical curves, firſt on one ſide and then on the other; ſometimes ſo near as to be rendered inviſible by his ſtronger light. Sometimes, when in or near their nodes, they paſs behind the ſun in their ſuperior ſemicircles, or paſs between him and us; in which caſe they appear like black ſpots on his diſk, as above mentioned. For the better comprehending of theſe motions, however, we have hitherto ſuppoſed the earth to ſtand ſtill in ſome part of its orbit, while they go round the ſun in theirs; but as this is not the caſe, it now remains to conſider the changes which take place in conſequence of the earth's motion.

(369.) Were the earth to ſtand ſtill in any part of its orbit, as at A, the places of conjunction, both in the ſuperior and inferior ſemicircle, as alſo of the greateſt elongation; and conſequently, the places of direct and retrograde motion, and of the ſtations of an inferior planet, would always be in the ſame part of the heavens. Thus, in Plate XVI. fig. 11 upon this ſuppoſition, the places of Mercury's ſtations would always be the points P and R, the arc of his direct motion PR, and of his retrograde motion RP; whereas, on account of the earth's motion, the places where theſe appearances happen are continually advancing forward in the ecliptic, according to the order

der of the signs. In fig. 12. let ABCD be the orbit of the earth; *e f g b* that of Mercury, ☉ the sun; GFKI an arc of the ecliptic extended to the fixed stars. When the earth is at A, the sun's geocentric place is at F; and Mercury, in order to a conjunction, must be in the line AF; that is, in his orbit he must be at *f* or *b*. Suppose him to be at *f*, in his inferior semicircle: if the earth stood still at A, his next conjunction would be when he is in his superior semicircles at *b*; the places of his greatest elongation also would be at *e* and *g*, and in the ecliptic at E and G; but supposing the earth to go on in its orbit from A to B, the sun's geocentric place is now at K; and Mercury, in order to be in conjunction, ought to be in the line BK at *m*. As by the motion of the earth, the places of Mercury's conjunctions with the sun, are thus continually carried round in the ecliptic, in consequence, so the places of his utmost elongations must be carried in consequence also. Thus, when the earth is at A, the places of his greatest elongation from the sun are in the ecliptic E and G; the motion of the earth from A to B advances them forward from G to L, and from E to I.

(370.) The geocentric motion of Venus may be explained in a similar manner; only as the motion of Venus is much slower than that of Mercury, his conjunctions, oppositions, elongations, and stations, all return much more frequently than those of Venus.

(371.) To explain the stationary appearances of the planets, it must be remembered that the diameter of the earth's orbit, and even of that of Saturn, are but mere points in comparison of the distance of the fixed stars; and, therefore, any two lines, absolutely parallel, though drawn at the distance of the diameter of Saturn's orbit from each other, would, if continued to the fixed stars, appear to us to terminate in the same point. Let the two circles, Plate XVI. fig. 13. represent the orbits of Venus and of the Earth; let the lines AE, BF, CG, DH, be parallel to SP; we may nevertheless affirm, that if continued to the distance of the fixed stars, they would all terminate in the same point with the line SP. Suppose, then, Venus at E, while the earth is at A, the visual ray, by which she is seen, in the line AE. Suppose again, that while Venus goes from E to F, the earth goes from A to B, the visual ray, by which Venus is now seen, is BF, parallel to AE; and therefore, Venus will be all that time stationary, appearing in that point of the heavens where SP extended would terminate: this station is at her changing from direct to retrograde. Again, suppose, when the earth is at C, Venus is at G, and the visual line CG; if, while the earth goes from C to D, Venus goes from G to H, so that she is seen in the line GH, parallel to CG, she will be all that time stationary, appearing in the point where a line drawn from S through P would terminate. This station is at her changing from retrograde to direct; and both are in her inferior semicircle.

(372.) An inferior planet, when in conjunction with the sun, in its inferior semicircle, is said to be in PERIGEE, and when in the other, to be in APOGEE, on account of its different distances from the Earth. Their real distances from the Earth, when in perigee, are variable, partly owing to the eccentricities of their orbits, as well as that of the Earth; and partly owing to the motions of the different bodies, by which it happens that they are in perigee, in different parts of their orbits. The least possible distance is, when the perigee happens at the time that the Earth is in its perihelion, and when the planet is in its aphelion.

(373.) The difference of distance between the Earth and inferior planets, at different times, makes a considerable variation in their apparent diameters, which indeed, is very observable in all the planets; and thus, they sometimes look considerably larger than at others. This difference of magnitude in Mercury, is nearly as $5\frac{1}{4}$ to 1; and in Venus, no less than 32 to 1. Any person, unassisted by instruments, may observe an inferior planet alternately approach nearer and nearer the sun, until at last it comes into conjunction with him, and then recedes farther and farther, till it is at its greatest elongation, which will be first on one side, and then on the other; but, if we observe the apparent change of place, of an inferior planet, in the sphere of the heavens, its direct motions, stations, and retrogradations, measuring its diameter frequently with the micrometer, we shall find, by its decrease at some times, and increase at others, that its distance from us is very considerably varied.

(374.) The apparent paths of Mercury and Venus, as seen from the earth, are delineated on Plate XVII. fig. 9. They appear to describe looped curves, which are extremely complicated. The darkest line represents that of Venus, which returns into itself every eighth year. The fainter looped curve represents the path of Mercury, which does not return into itself at any assignable period. The double circle, with the months marked upon it, represents the apparent path of the sun, (for the Earth is here considered as apparently at rest,) and the outer circle represents the ecliptic. The apparent stations and retrogradations of these planets, are obviously shewn from this figure.

(375.) The apparent paths of Mars, Jupiter, and Saturn, are given in Pl. XVI. fig. 14. The numbers marked on the looped curves, are the years for which the motions are shewn. This figure also serves well for shewing the apparent stations, &c. of the superior planets.

(376.) As the superior planets move in a larger orbit than the Earth, they can only be in conjunction with the sun, when they are on that side opposite to the Earth; as, on the other hand, they are in opposition to him, when the Earth is between the sun and them. They are in quadrature with him, when the geocentric places are 90° distant from that of the sun. In order to understand their apparent motions, we shall suppose them to stand still, in some part of their orbit, while the earth makes a complete revolution round hers; in which case, any superior planet would then have the following appearances:

(377.) I. While the earth is in her most distant semicircle, the motion of the planet will be direct. II. While the earth is in her nearest semicircle, the planet will be retrograde. III. While the earth

near thoſe places of its orbit, where a line wn from the planet, would be a tangent, it uld appear to be ſtationary. Thus, in Plate II. fig. 15. let *a b c d* repreſent the orbit of the rth; S the Sun: EFG an arc of the orbit of piter; ABC an arc of the ecliptic, projected the ſphere of the fixed ſtars. Suppoſe Jupiter continue at F, while the earth goes round in r orbit, according to the order of the letters *b c d*. While the earth is in the ſemicircle moſt tant from Jupiter, going from *a* to *b* and m *b* to *c*, his motion in the heavens would pear direct, or from A to B, and from B C: but, while the earth is in its neareſt ſemi-cle *c d e*, the motion of Jupiter would appear trograde from C to B. and from B to A; for *b*, *c*, *d*, may be conſidered as ſo many diffe-nt ſtations, from whence an inhabitant of the rth would view Jupiter at different ſeaſons of e year, and a ſtraight line drawn from each of eſe ſtations, through F the place of Jupiter, id continued to the ecliptic, would ſhew his ap-arent place there to be ſucceſſively at A, B, C, , A. While the earth is near the points of con-ct, *a* and *c*, Jupiter would appear ſtationary, be-ıuſe the viſual ray drawn through both planets, oes not ſenſibly differ from the tangent F*a* or F*c*. When the earth is at *b*, a line drawn from *b* thro' and F to the ecliptic, ſhews Jupiter to be in onjunction with the ſun at B. When the earth at *d*, a line drawn from *d* through S, continued the ecliptic, would terminate in a point oppo-te to B; which ſhews Jupiter then to be in op-oſition to the ſun: and thus, it appears, that his notion is direct in the conjunction, but retrograde hen in oppoſition, with the ſun.

(378.) The DIRECT MOTION of a ſuperior pla-et is ſwifter the nearer it is to a conjunction, and lower as it approaches to a quadrature with the un. Thus, in fig. 16. let ☉ be the ſun; the lit-le circle round it, the orbit of the earth, where-f *a b c d e f g* is the moſt diſtant ſemicircle; OPQ, n arc of the orbit of Jupiter; and ABCDEFG, n arc of the ecliptic in the ſphere of the fixed tars. If we ſuppoſe Jupiter to ſtand ſtill at P, by the earth's motion from *a* to *g*, he would ap-pear to move direct from A to G, deſcribing the unequal arcs AB, BC, CD, DE, EF, FG, in e-qual times. When the earth is at *d* Jupiter is in conjunction with the ſun at D, and there his di-rect motion is ſwifteſt. When the earth is in that part of her orbit where a line drawn from Jupiter would touch it, as in the points *e* or *g*, Jupiter is nearly in quadrature with the ſun; and the near-er the earth is to any of thoſe points, the ſlower is the geocentric motion of Jupiter; for the arcs CD and DE are greater than BC or EF, and the arcs BC and EF are greater than AB or FG.

(379.) The RETROGRADE MOTION of a ſuperi-or planet is ſwifter the nearer it is to an oppoſi-tion, and ſlower as it approaches to a quadrature, with the ſun. Thus, let ☉, fig. 17. be the ſun; the little circle round it the orbit of the earth, whereof *g h i k l m n* is the neareſt ſemicircle; OPQ, an arc of the orbit of Jupiter, NKG an arc of the ecliptic: if we ſuppoſe Jupiter to ſtand ſtill at P, by the earth's motion from *g* to *n*, he would appear to move retrograde from G to N, deſcribing the unequal arcs GH, HI, IK, KL, LM, MN, in equal times. When the earth is at *k*, Jupiter appears at K, in oppoſition to the ſun, and there his retrograde motion is ſwifteſt. When the earth is either at *g* or *n*, the points of contact of the tangents P*g* and P*n*, Jupiter is nearly in quadrature with the ſun: and the nearer he is to either of theſe points, the ſlower is his retrogradation; for the arcs IK and KL are greater than HI or LM: and the arcs HI and KM are greater than GH or MN. Since the direct motion is ſwifteſt when the earth is at *d*, and continues diminiſhing till it changes to retrograde, it muſt be inſenſible near the time of change: and, in like manner, the retrograde motion being ſwifteſt when the earth is in *k*, and diminiſhing gradually till it changes to direct, muſt alſo at the time of that change be inſenſible; for any motion gradually decreaſing till it changes into a contrary one gradually increaſing, muſt at the time of the change be altogether inſenſible.

(380.) The ſame changes in the apparent motions of this planet will alſo take place, if we ſuppoſe him to go on ſlowly in his orbit; only they will happen every year when the earth is in different parts of her orbit, and conſequently at different times of the year. Thus, (fig. 15.) let us ſuppoſe, that, while the earth goes round her orbit, Jupiter goes from F to G, the points of the earth's orbit from which Jupiter will now appear to be ſtationary will be *a* and *y*; and conſequently his ſtations muſt be at a time of the year different from the former. The conjunction of Jupiter with the ſun will now be when the earth is at *f*, and his oppoſition when it is at *e*; for which reaſon theſe alſo will happen, at times of the year different from thoſe of the preceeding opposition and conjuction. The motion of Saturn is ſo ſlow, that it makes but little alteration either in the times or places of his conjunction or oppoſition; and no doubt the ſame will take place in a more eminent degree in Herſchel; but the motion of Mars is ſo much ſwifter than even that of Jupiter, that both the times and places of his conjunctions and oppoſitions are thereby very much altered.

(381.) A ſuperior planet is in APOGEE when in conjunction with the ſun, and in PERIGEE when in oppoſition; and every one of the ſuperior planets is at its leaſt poſſible diſtance from the earth where it is in perigee and perihelion at the ſame time. Their apparent diameters are variable, according to their diſtances, like thoſe of the inferior planets; and this, as might naturally be expected, is moſt remarkable in the planet Mars, who is neareſt us. In his neareſt approach, this planet is 25 times larger than when fartheſt off, Jupiter twice and a half, and Saturn once and a half. As the times of conjunction, utmoſt elongation, direct or retrograde motions of the inferior planets, depend on the combinations of their motions in their orbits with the motion of the Earth in its orbit; any of theſe appearances will be more frequent in Mercury than in Venus, becauſe the former moves with a ſwifter motion in his orbit, and conſequently muſt more frequently paſs through thoſe places where he is in conjunction, &c.

(382.) The time in which any of the inferior planets will return into a given ſituation, may be eaſily known. Compute the diurnal heliocentric motions of Venus and of the Earth: the difference of theſe motions is the diurnal motion of Venus from the Earth, or the quantity by which Venus would be ſeen to recede from the Earth every day by a ſpectator placed in the Sun: thus the mean motion of Venus is every day about 59 minutes and 8 ſeconds; the difference is 37 minutes. Therefore, As 37 minutes is to 360°, or to 21,600 minutes, ſo is one day to the time wherein Venus, having left the earth, recedes from her 360 degrees; that is, to the time wherein ſhe returns to the earth again, or the time between two conjunctions of the ſame kind.

(383.) The calculations of the times are here made according to the mean or equable motions of the planets: and is therefore called a mean conjunction: but becauſe Venus and the Earth are really carried in elliptic orbits, in which their motions are ſometimes ſwifter and ſometimes ſlower, the true conjunctions may happen ſome days either ſooner or later than what theſe rules will give. The time of the true conjunction is to be computed from that of the mean conjunction in the following manner. Find by aſtronomical tables the places of Venus and the Earth in the ecliptic, from which we ſhall have the diſtance of the two as ſeen from the Sun; compute alſo for the ſame time the angular motions of theſe two planets for any given time, ſuppoſe ſix hours; the difference of theſe two motions will give the acceſs of Venus to the earth, or her receſs from it in ſix hours. As this difference is to the arc between the places of Venus and the earth at the time of a mean conjunction, ſo is ſix hours to the time between the mean conjunction and the true. This time added to, or ſubtracted from, the time of the mean conjuction, according as Venus is in antecedence or conſequence from the earth, ſhows the time of their true conjunction.

(384) As to the conjunctions, oppoſitions, direct and retrograde motions, &c. of the ſuperior planets, they depend on the combinations of their motions with that of the earth, and are more frequent in Saturn than in Jupiter, and in Jupiter than in Mars, but moſt frequent of all in Herſchel; becauſe the ſlower the motion of the planet is, the ſooner the earth will overtake it, ſo as to have it again in any given ſituation.

(385.) Thus, ſuppoſe Saturn to be in conjunction with the ſun in ♈, if he were to ſtand ſtill for one year, then he would again be in conjunction in ♈; but as he goes on ſlowly, according to the order of the ſigns, about 12° annually, the earth muſt go through almoſt 13° more than an entire revolution; ſo that there will be almoſt a year and 13 days, between any conjunction between the Sun and Saturn, and the conjunction immediately following. As Jupiter moves in his orbit with greater velocity than Saturn, the Earth muſt have a proportionably larger ſpace added to the year; and as Mars moves ſwifter ſtill, the time betwixt any two of his conjunctions muſt be ſtill longer. The time when a ſuperior planet will return into any given ſituation, may be found by the methods already laid down for the inferior planets; and the true conjunctions, &c. may be found in the ſuperior planets as in the inferior.

Sect. II. *Of the* Velocity, Figure, Motions, *&c. of the* Earth.

(386.) The Earth is 95,173,000 miles from the ſun, and goes round in 365 days 5 hours 49 minutes, from any equinox or ſolſtice to the ſame again; but from any fixed ſtar to the ſame again, as ſeen from the ſun, in 365 days 6 hours 9 minutes; the former being the length of the tropical year, and the latter the length of the ſideral. It travels at the rate of 68,000 miles every hour; a motion, which, though upwards of 140 times ſwifter than that of a cannon ball, is little more than half as ſwift as Mercury's motion in his orbit. The earth's diameter is 7970 miles; and by turning round its axis every 24 hours from weſt to eaſt, it cauſes an apparent diurnal motion of all the heavenly bodies from eaſt to weſt. By this rapid motion of the earth on its axis, the inhabitants about the equator are carried 1042 miles every hour, whilſt thoſe on the parallel of London are carried only about 580, beſides the 68,000 miles by the annual motion above mentioned, which is common to all places whatever.

(387.) A variety of circumſtances afford the cleareſt evidence, that the earth is of a globular figure. I. When we are at ſea on board a ſhip, we may be out of ſight of land, when the land is near enough to be viſible, if it were not hid from our eye by the convexity of the water. Thus, let ABCD, *fig.* 10 *Plate* XVII, repreſent a portion of the globe of the earth. Let M be the top of a mountain; this cannot be ſeen by a perſon on board the ſhip at B, becauſe a line drawn from M to his eye at E is intercepted by the convexity of the water: but let the ſhip come to C, then the mountain will be viſible, becauſe a line may be drawn from M to his eye at E. II. The higher the eye, the farther the view will be extended. It is very common for ſailors from the top of the maſt of a ſhip to diſcover land or ſhips at a much greater diſtance than they can do when they ſtand upon deck. III. When we ſtand on ſhore, the higheſt part of a ſhip is viſible at the greateſt diſtance. If a ſhip is going from us out to ſea, we ſhall continue to ſee the maſt after the hull or body of the ſhip diſappears, and the top of the maſt will continue to be ſeen the longeſt. If a ſhip is coming towards us, the top of the maſt comes firſt in view, and we ſee more and more till at laſt the hull appears. If the ſurface of the ſea were a flat plain, a line might be drawn from any object ſituated upon it, as the ſhip D, *fig.* 11. to the eye, whether placed high or low, at A or B. In this caſe, any object upon the earth or ſea would be viſible at any diſtance which was not ſo great as to make the appearance of it too faint, or the angle under which it appears too ſmall, to be ſeen by us. An object would be viſible at the ſame diſtance, whether the eye were high or low. Not the higheſt, but the largeſt, objects would be viſible to the greateſt diſtance, ſo that we ſhould be able to ſee the hulk of a ſhip farther off than the maſt.

(388. IV. Several navigators, ſuch as Ferdinand Magellan, Sir Francis Drake, Lord Anſon, &c.

in Cook, &c. have ſailed round the globe; not an exact circle, the land preventing them, but going in and out as the ſhores happened to lie. All the appearances in the heavens are the ſame whether at land or ſea. VI. Eclipſes of the moon ariſe from the ſhadow of the earth, which is always circular. Although the earth preſents, during ſeveral hours, different portions of its ſurface to the moon, yet ſtill the ſhadow is round. The ſmall inequalities upon the ſurface of the earth bear no kind of proportion to its magnitude ſufficient to alter the appearance of its ſhadow.

(389.) VII. The globular figure of the earth is also inferred from the operation of levelling, in which it is found neceſſary, to make an allowance for the difference between the apparent and true level.

(390.) The earth's AXIS makes an angle of $23\frac{1}{2}^{\circ}$ with the axis of its orbit, and its poſition at any time is parallel to its poſition at any other time. Thus it points always to the ſame quarter of the heavens, throughout its annual courſe. That the earth moves round the ſun, may be proved, beyond a doubt, by the following arguments.

(391.) I. The ſun is found by the moſt accurate obſervations, to be immenſely bigger than the earth; for his diameter, as ſeen by us, ſubtends an angle of more than 30', but it is certain, that the earth, were it ſeen from the ſun, would not ſubtend a greater angle than 16". If, therefore, the ſun be formed of materials not very much rarer than the earth, (and there is no reaſon to believe, that it is much leſs denſe,) the quantity of matter in the ſun, muſt far exceed the whole maſs of matter in all the planets; and to ſuppoſe, that gravity retains all the other planets in their orbits, without affecting the earth, would be as abſurd as to ſuppoſe, that 6 cannon bullets might be projected up to different heights in the air, and that 5 of them ſhould fall to the ground, but that the 6th, though neither the higheſt nor the loweſt, ſhould remain ſuſpended in the air without falling, and the earth move round it.

(392.) There is no ſuch thing in nature as a heavy body moving round a light one as its centre of motion. A pebble faſtened to a mill-ſtone by a ſtring, may, by an eaſy impulſe, be made to circulate round the mill-ſtone: but no impulſe can make a mill-ſtone circulate round a looſe pebble; for the mill-ſtone would go off, and carry the pebble along with it. The ſun is ſo very much bigger and heavier than the earth, that, if he were moved out of his place, not only the earth, but all the other planets, if they were united into one maſs, would be carried along with him as the pebble would be with the mill-ſtone.

(393.) II. The celeſtial motions become exceedingly more ſimple, and free of thoſe looped contortions which muſt be ſuppoſed in the other caſe; and which are extremely improbable and incompatible with what we know of motion; as the reader may eaſily judge, from viewing *fig.* 14. *Plate* XVI, and *fig.* 9. *Plate* XVII, where the earth is conſidered as at reſt, while the ſun moves round it, and the planets are ſuppoſed to move in circular, or rather elliptical orbits round the ſun.

(394.) III. If the earth revolve round the ſun, then the analogy, between the ſquares of the periodic times and the cubes of the diſtances, will obtain in all the bodies which circulate round a common centre; whereas this will not be the caſe with reſpect to the ſun and moon, if both turn round the earth.

(395.) IV. Beſides theſe, other proofs might be given; but the moſt complete proof of all, and which indeed amounts to a demonſtration is, the aberration of the fixed ſtars, ariſing from the progreſſive motion of light, combined with the earth's annual motion round the ſun; a diſcovery made by Dr BRADLEY, and one of the fineſt in modern aſtronomy.

(396.) By frequent obſervations of the eclipſes of Jupiter's ſatellites, it is found, that light is about 8 minutes in moving from the ſun to the earth. And ſince the earth deſcribes about 1 degree, or 3600", in a day, or 1440^{m}, in 8 minutes, it will deſcribe 20", in its orbit; therefore the velocity of light is to the velocity of the earth in its orbit, as radius to an arch of 20 ſeconds, or the third part of a minute, that is, as 1 to $\frac{\cdot 0002909}{3}$ or ·0000969, or as 10300 to 1. That is, the velocity of light is 10300 times greater than the velocity of the earth in its orbit. Now if AN (*Plate* XVII. *fig.* 12.) be the way or path of a body in free ſpace, as of a ray of light; its apparent way on a moveable plane will be different. For it will be that which is made by the compoſition of the two motions of the body and plane. Thus if AN be deſcribed in any time by the body, and NF be deſcribed by (a point in) the plane, in the ſame time, as the plane moves forward in the direction NF or AB, it leaves all the points of the fixed line AN behind it, all which will therefore ſeem to move backwards in the plane. Therefore make ND = NF, being taken backwards or contrary to the motion of the plane; and the body, inſtead of going to N in the free ſpace, will ſeem to go to D, in the ſame time, upon the moveable plane; and therefore AD will be the apparent path of the body in that plane.

(397.) It will be the ſame thing, if we ſuppoſe the plane fixed, and the body to have the plane's motion communicated to it, in a contrary direction, ſo as the relative motion be the ſame as before. Thus if the body moves from B to A, in the ſame time that it would alſo move from A to N, then by that compound motion it would move along the diagonal BN of the parallelogram whoſe ſides are BA, AN, and in the ſame time. Therefore rays of light emitted from a ſtar in the direction AN, will fall upon the point D of the moving plane; that is, upon the eye of the obſerver, in the direction AD: and an obſerver at D will ſuppoſe the ſtar ſituated in the line DA. If BN be parallel to AD, and the point D tranſlated to N in the ſame time; an obſerver at N will ſuppoſe the ſtar ſituated in the line BN; making the angle BNF or ADF leſs than ANF, the angle it would appear under if the plane was at reſt. So that the angle of elevation BNF, above the line of direction NE, of the obſerver, is leſs than before being taken on the ſide F, towards which the obſerver moves. The obſerver, inſtead of ſeeing the ſtar at A its real place, will ſee it at B its apparent place; but if the obſerver moves from F to N

and D, and B be the real place of the ſtar, its apparent place would be at A to an obſerver at N.

(398.) The apparent place B is always in the plane of aberration, drawn through the way of the obſerver NF, and the line NA drawn from the obſerver to the real place of the ſtar; for AB being parallel to NF, is in the plane ADNF. The angle BNA or NAD is the angle of aberration; by the quantity of this angle the ſtar is depreſſed, in going towards it; or raiſed in going from it. In the triangle AND; AN : ND :: S.ADN : S.NAD; and AN and ND being given; the S.NAD the aberration will be as the S.ADN. Becauſe AN is 10300 times greater than ND; the S.NAD does not differ from its arch or angle; whence, the angle of aberration NAD or ANB is always as the ſine of the angle ADN, or ANF, which are nearly equal, and which may be called the *angle of the* EARTH'S WAY. Hence the angle of aberration ANB is greateſt, when AN is perpendicular to ND; and becomes nothing, when ANF is nothing. Since AN is to ND, as radius to 20″; when AN is perpendicular to ND, the angle NAD or ANB will be 20″, which is the greateſt it can be. In other caſes, as radius to S. angle of the earth's way ANF :: ſo 20″, to the aberration, anſwering to that angle; which angle is always taken in the plane of aberration ADNF.

(399.) In *Plate* XVII. *fig.* 13. let BCDE be the earth's orbit, S the ſun, A or Q a ſtar, N any place of the earth in its orbit. Through the ſtar A draw the circle AH perpendicular to the plane of the ecliptic, and draw KSBH, and ESC perpendicular to it, or parallel to the tangent at B. Draw the tangent N*d*, and draw NI towards the ſtar, and make NI to N*d* as the velocity of light to that of the earth, or as 10300 to 1, and draw *d*I which leads to the apparent place of the ſtar; and ſuppoſe DA, SA parallel to *d*I, NI; then DA will alſo lead to the apparent place of the ſtar. Draw SFG perpendicular to SN, or parallel to N*d*. Then will IN*d* be the plane of aberration. This plane continually changes its ſituation, revolving round the ſun in a year along with the tangent N*d*. Since AS, SF are parallel to IN, N*f*, ASF is equal to IN*f*, and ASF is equal to the angle of the earth's way. Hence the plane ASF may be taken for the plane of aberration, which continually turns round the line AS, as the earth revolves about the ſun; the line SF being always in quadrature with the earth at N.

(400.) Let the earth be at E, then the plane of aberration ASB will be perpendicular to the ecliptic; and the angle of the earth's way ASB is the leaſt that it can be, and the angle of the aberration the leaſt. Whilſt the earth moves to B, the angle of the earth's way, and of aberration increaſes, and at B the plane of aberration is ACS, and the angle of the earth's way ASC, a right angle, which is the greateſt it can be; therefore the angle of aberration is the greateſt poſſible. While the earth moves to C, the angles of the earth's way and aberration decreaſe again, and at C are the leaſt; and in moving to K they increaſe again to K, where they are greateſt. From K to E they diminiſh again, where they are leaſt.

(401.) It is evident then, that whilſt the earth is at E moving towards N, the ſtar's apparent place is at *c* lower than A; at B moving towards F, it appears at *b* forward. When the earth is at C, the ſtar appears at *c* above A. And when the earth is at K, the ſtar is ſeen at *k*, having gone backward. Hence the apparent place of a ſtar deſcribes a ſmall ellipſis in a year, about the true place of the ſtar in its centre, whoſe tranſverſe axis is parallel to the ecliptic; and leſſer axis perpendicular to it. This ellipſis is *bcke*, anſwering to places of the earth at B, C, K, E. And the points *k*, *c*, *k*, *e*, anſwer reſpectively to the points C, K, E, B, where the plane of aberration cuts the ecliptic, being 90 degrees before the earth, or 90 degrees behind the ſun.

(402.) The ſtrongeſt objection, that can be made againſt the earth's moving round the ſun like the other planets, is, that, in oppoſite points of the earth's orbit, its axis, which always keeps a parallel direction, would point to different fixed ſtars; which is not found to be fact. But this objection is eaſily removed, by conſidering the immenſe diſtance of the ſtars in reſpect of the diameter of the earth's orbit; the latter being no more than a point when compared to the former. If we lay a ruler on the ſide of a table, and along the edge of the ruler view the top of a ſpire at ten miles diſtance; then lay the ruler on the oppoſite ſide of the table in a parallel ſituation to what it had before, and the ſpire will ſtill appear along the edge of the ruler; becauſe our eyes, even when aſſiſted by the beſt inſtruments, are incapable of diſtinguiſhing ſo ſmall a change at ſo great a diſtance. As the apparent places of the ſtars, therefore, correſpond with this theory, the motion of the earth and the motion of light are both determined.

(403.) In fact, we find that the ſun, and thoſe planets on which there are viſible ſpots, turn round their axes: for the ſpots in general move regularly over their diſks, allowing for the variations already taken notice of. Hence we may reaſonably conclude, that the other planets, on which we ſee no ſpots, and the earth, which is likewiſe a planet, have ſuch rotations. But being incapable of leaving the earth to view it at a diſtance, and its rotation being ſmooth and uniform, we can neither ſee it move on its axis as we do the planets, nor feel ourſelves affected by its motion. Yet there is one effect of ſuch motion, which will enable us to judge with certainty whether the earth revolves on its axis or not.

(404.) All globes which do not turn round their axes, will be perfect ſpheres, on account of the equality of the weight of bodies on their ſurfaces; eſpecially of the fluid parts. But all globes, which turn on their axes will be oblate ſpheroides; that is, their ſurfaces will be higher or farther from the centre in the equatorial than in the polar regions: for, as the equatorial parts move quickeſt, they will recede fartheſt from the axis of motion, and enlarge the equatorial diameter. That our earth is really of this figure, is demonſtrable from the unequal vibrations of a pendulum, and the unequal lengths of degrees in different latitudes.—Since then, the earth is higher at the equator than at the poles, the ſea, which naturally runs downward, or toward the places which are neareſt the centre, would run towards the polar regions, and leave

ve the equatorial parts dry, if the centrifugal ce of theſe parts, by which the waters were ried thither, did not keep them from returning. ie earth's equatorial diameter is 36 miles longer an its axis.

(405.) It is found that bodies near the poles are avier than thoſe towards the equator, becauſe ey are nearer the earth's centre, where the whole ce of the earth's attraction is accumulated. ey are alſo heavier, becauſe their centrifugal ce is leſs, on account of their diurnal motion ing ſlower. For both theſe reaſons, bodies card from the poles towards the equator gradually e their weight. Experiments prove, that a penlum, which vibrates ſeconds near the poles, viates ſlower near the equator, which ſhows that is lighter or leſs attracted there. To make it cillate in the ſame time, it is found neceſſary to miniſh its length. By comparing the different ngths of pendulums ſwinging ſeconds at the eiator and at London, it is found that a pendum muſt be $2\frac{169}{200}$ lines (or 12th parts of an inch) orter at the equator than at the poles.

(406.) A perſon on the earth can no more be nſible of its undiſturbed motion on its axis, than ie in the cabin of a ſhip on ſmooth water can be nſible of the ſhip's motion, when it turns gently id uniformly round. It is therefore no argument againſt the earth's diurnal motion, that we o not feel it; nor are the apparent revolutions f the celeſtial bodies every day, a proof of the ality of theſe motions; for whether we or they volve, the appearance is the very ſame. A perſon looking through the cabin windows of a ſhip, s ſtrongly fancies the objects on land to go round hen the ſhip turns, as if they actually did ſo.

(407.) The other common objections againſt he earth's motion on its axis, are eaſily anſwered. ome imagine, that if the earth turns eaſtward, s it certainly does, if it turns at all, a ball fired erpendicularly upward in the air, ſhould fall conſiderably weſtward of the place it was projected rom. This objection will be found to have no weight, if we conſider that the gun and ball partake of the earth's motion; and therefore the ball, being carried forward with the air as quick as the earth and air turn, muſt fall down on the ſame place. A ſtone let fall from the top of a main-maſt, if it meets with no obſtacle, falls on the deck as near the foot of the maſt when the ſhip ſails as when it does not.

(408.) As for thoſe ſcriptural expreſſions which ſeem to contradict the earth's motion, this general anſwer may be made to them all, that, The ſcriptures were never intended to inſtruct us in philoſophy or aſtronomy; and therefore on thoſe ſubjects, expreſſions are not always to be taken in the literal ſenſe, but for the moſt part as accommodated to the common apprehenſions of mankind. Men of ſenſe in all ages, when not treating of the ſciences purpoſely, have uſed common language; and it would be abſurd to adopt any other in addreſſing the majority of mankind.

(409.) The annual motion of the earth has been effectually confirmed by an argument drawn from the progreſſive motion of light; and from the ſame conſideration the truth of the diurnal motion may be completely eſtabliſhed.

(410.) In conſequence of the progreſſive motion of light, the apparent place of a fixed ſtar is eaſt of its true place, and the difference is proportional to the coſine of the ſtar's declination; this diſplacement of the fixed ſtars has changed, becauſe of the preceſſion of the equinoctial points. Therefore, if the diurnal revolution of the heavens were a real motion, the whole heavens muſt have changed their appearance; and the reſpective poſitions of the ſtars muſt be very different now, from what they were in the time of Hipparchus. A ſtar which is now near the vernal equinox muſt have changed its apparent diſtance, at leaſt 5° from another ecliptical ſtar which is 60° eaſt from it. Nay it is highly probable, that no zodiacal ſtar could be ever viſible; ſuch would have been the direction that the rays of light muſt have taken, becauſe of their own proper motion being compounded with that of the ſtar, whoſe velocity muſt have been exceedingly great, by reaſon of its diſtance from the poles of the motion. But ſince no ſuch remarkable diſplacement of the ſtars has been obſerved, we may conclude, that the cauſe which would have produced it, has no exiſtence; and that the revolutions of the heavens is not a *real*, but only an *apparent* motion.

(411.) The ANNUAL and DIURNAL MOTIONS of the earth, together with the different lengths of days and nights, and all the beautiful variety of ſeaſons, depending on thoſe motions, may be thus illuſtrated.

(412.) In PLATE XVII. fig. 1. let FGHI be the earth, O its centre; and let it revolve about an axis perpendicular to the plane of the figure, in the order IFGH; that is, from weſt to eaſt. Let A be the ſun, draw AFOHC, and GOI perpendicular to it; let a ſpectator be at I; then ſince the tangent at I (which repreſents the horizon) will be parallel to AFH, and A at an immenſe diſtance; they will nearly meet in A, and the ſun at A will be riſing in the horizon at I. As the earth moves round, the ſpectator is carried towards F, and the ſun at A ſeems to riſe higher and higher; and when the ſpectator is arrived at F, then the ſun is at the higheſt. As the earth ſtill turns round, and the ſpectator is carried from F towards G, the ſun appears to deſcend, as if it moved towards D; and when the ſpectator is arrived at G, then the ſun appears in the tangent at G; that is, in the horizon at G; and therefore the ſun is ſetting. Afterwards, all the time the ſpectator is moved through GHI, the ſun appears under the horizon, till it comes at I, where the ſun ſeems to riſe again.

(413.) Thus it is evident, that while the ſpectator is carried through the illuminated half of the earth IFG, it is day light; at the middle point F, it is noon-day; at the dark hemiſphere GHI it is night; and at H, it is midnight. And thus the viciſſitude of day and night appears, by, the rotation of the earth about its axis. What has been ſaid of the ſun, is equally true of the moon, or any ſtar placed at A. And therefore all the celeſtial bodies ſeem to riſe and ſet by turns, one after another, according to their various ſituations. For let A, B, C, D be four ſtars: when the ſpectator is at I, the ſtar A riſes; and when at G, it ſets. When the ſpectator is at F, B riſes; and when

when it is at H, it sets. When he is at G, C rises; and when at I, it sets. When the spectator is at H, D rises; and when at F, it sets.

(414.) Hence it is the very same thing, as to the diurnal motions, WHETHER THE EARTH MOVES uniformly about its axis, while the HEAVENS STAND STILL; or whether the HEAVENS MOVE uniformly round, while the EARTH STANDS STILL; the phænomena being exactly the same either way. For whether the spectator move uniformly in the arch IF, from west to east, whilst A is fixed; or A moves uniformly in the arch AD, from east to west, whilst I is fixed; the same angle will be described, and therefore the altitude of A, above the horizon will be the same either way.

SECT. III. *Of the* SEASONS.

(415.) To explain the causes of the various seasons, see PLATE XVII. fig. 2. and supply ♎ in the middle of the dark circle ENQA. Let ♈ ♋ ♎ ♑ be the earth's orbit, and S the sun. This orbit is so small in respect to the distance of the fixed stars, that the same aspect of the heavens will appear, whether a man be placed in the earth or in the sun. If the earth be at ♈, a spectator will see the sun in ♎; when the earth comes to ♉, he will see the sun in ♏; and the sun will appear to have moved through ♎ ♏. Whilst the earth is moving to ♊, the sun will seem to pass through ♏ ♐; and a person in the earth observes the sun to go through the same space in the heavens, that a spectator at the sun would see the earth go through: and as he is not sensible of the earth's motion, he ascribes that motion to the sun, which in reality is unmoved. Hence, because the relative motion is the same, whether of the two is moved, and all effects are the same as to their places; astronomers generally suppose the sun to move along the ecliptic, describing its orbit round the earth at rest.

(416.) Let NEAQ be the earth, NA be its axis, N the north pole, A the south; EQ the equinoctial, and PR a parallel of latitude passing through any place. Draw a plane G ♈ I perpendicular to ♑ S ♋, which divides the illuminated hemisphere from the dark one. The axis NA is inclined to the plane of the ecliptic or earth's orbit, in an angle of 66½ degrees: and during the earth's motion in its orbit, the axis always remains in a parallel position, or pointing to the same star. The earth also moves uniformly round this axis; and describes equal arches in equal times. Now let the earth be at ♎; in this position, the circle dividing the light and dark hemispheres passes through the poles N and A, and divides all the parallels as PR into two equal parts; therefore any point in that parallel, as the earth revolves round, will stay as long in the light hemisphere as in the dark; that is, the days and nights are equal. As it moves to ♏, the pole N comes into the light hemisphere, by reason of the oblique position of the axis NA; and as it proceeds to ♐ and ♑, the light hemisphere reaches farther and farther beyond N, till coming to ♑, it is at the farthest, reaching to G, and making the arch NG 23½ degrees, the complement of N ♑ S, or 66½ degrees. Then the opposite pole A is as far involved in the dark hemisphere; whence in north latitudes, or in the hemisphere E N Q, the days have been increasing from ♎ to ♑, where they are at their longest; for the greater part of the parallel P R is in the illuminated hemisphere, and the smaller part in the dark.

(417.) In the opposite or southern hemisphere the days have been decreasing, and are at their shortest when the earth is at ♑: for all parallels to E Q have their greater part in the dark hemisphere. If through the point G a parallel be described, this parallel is called the *arctic circle*; and all the space contained therein is illuminated, and there is no night, when the earth is at ♑. For the same reason, the space within a parallel drawn through I, will be all dark, and all is night there. If a parallel be drawn through B, where S ♋ cuts the arch N E, that parallel is called the *tropic of Cancer*; and then the sun will shine perpendicular upon the inhabitants in that parallel. This is the summer season for those that are in the hemisphere ENQ, and the winter for those that live in EAQ; and since E Q is equally divided by the circle of light and darkness G I, the days and nights are always equal under the equinoctial.

(418.) While the earth moves through ♒ and ♓ to ♈, the circle of light and darkness comes nearer and nearer to the pole N, the angle N ♑ G, and consequently B ♑ E grows less and less, till they vanish in ♈; then the circle of light and darkness passes again through the poles N and A, bisecting all the parallels as P R; and the days and nights are again equal, all over the earth.

(419.) While the earth moves through ♈, ♉, ♊, to ♋, the sun seems to go through ♎, ♏, ♐, to ♑; and the circle separating light and darkness falls short more and more of the north pole N, and goes further and further beyond the south pole A; whence the parallels cut by that circle will have the greater part in the dark in the north hemisphere; but in the south hemisphere, the greater part will be in the light: and it is winter to the northern hemisphere ENQ, the days being at the shortest; and summer to the southern hemisphere E A Q, their days being at their longest. Within the parallel drawn through G, there will be no day whilst the earth is at ♋; and in the parallel drawn through I, there will be no night. At the pole A it will be day for 6 months, and at the pole N it will be night for 6 months; just the contrary of what happens when the earth is at ♑. In this position, if a parallel be drawn through ♏, the sun will shine perpendicular to the earth in that parallel, and it is called the *tropic of Capricorn*; and a parallel drawn through I is called the *antarctic circle*.

(420.) When the earth moves from ♋ through ♌ and ♍ to ♎ again; it is evident the circle separating light and darkness draws nearer and nearer to the poles N and A, by which the light and dark parts of the parallels become nearer an equality, and so to the days and nights. Therefore in the north hemisphere ENQ, the days are increasing; and in the south hemisphere they are decreasing: and the days and nights become equal in every place, when the earth arrives at ♎.

(421.) In this manner are the several seasons caused,

ſed, being owing to the obliquity of the axis otation of the earth, to the plane of the earth's it. But if the axis was perpendicular to it, re could be no variety in the length of days in atever part of the orbit the earth was; and all ons would be alike. Thus the OBLIQUITY of EARTH'S AXIS to the ECLIPTIC, or which is the ie thing, of the EQUINOCTIAL to the ECLIPTIC; he CAUSE of the different ſeaſons, ſummer, win-, ſpring, and autumn during the year. With- this, there could be no difference of ſeaſons; l conſequently it could not be eaſy to know the gth of the year, without obſervations of the rs. For the length of the year is known from ding the time by obſervation, when the ſun is the equinoctial points; and there being no ſuch ints to obſerve by, there could be no method t to obſerve by the poſition of the ſtars, when : ſame ſtar was again in oppoſition to the ſun, ich none but an aſtronomer could do.

(422.) The ſun appears 47 degrees HIGHER in : ſummer tropic, than it does in the winter tro- : ; for in ſummer it ſeems to have aſcended rough the arch B E; and in winter, to have de- nded through the arch B Q equal to B E; and eir ſum is 47 degrees.

(423.) All theſe phænomena may be thus repre- nted: Take a ſmall globe that has the equinoc- l and parallels drawn on it; and placing a can- e upon a table move the globe round the candle a circle parallel to the table, ſo that the axis of ie equator may be oblique to that circle, and be ept always in a parallel poſition whilſt it moves out. The candle will illuminate the globe as it is rried round, juſt as the ſun does the earth in its bit; and the poles and the parallels will be the ſame ay affected with light and darkneſs as the globe.

(424.) The orbit of the earth being elliptical, nd the ſun conſtantly keeping in its lower focus, hich is 1,617,941 miles from the middle point of he longer axis, the earth approaches twice as ear, or 3,235,882 miles nearer the ſun at one ime of the year than at another; for the ſun ap- earing under a larger angle in our winter than ummer, proves that the earth is nearer the ſun in vinter. But here this queſtion naturally ariſes, Why have we not the hotteſt weather when the arth is neareſt the ſun? In anſwer it muſt be ob- rved, that the eccentricity of the earth's orbit, or 1,617,941 miles, bears no greater proportion o the earth's mean diſtance from the ſun, than 17 loes to 1000; and therefore this ſmall difference of diſtance cannot occaſion any great difference of heat or cold.

(425.) But the principal cauſe of this difference is, that in winter the ſun's rays fall ſo obliquely upon us, that any given number of them is ſpread over a much greater portion of the earth's ſurface where we live; and each point muſt then have fewer rays than in ſummer. There comes alſo a greater degree of cold in the long winter nights than there can return of heat in ſo ſhort days; and on both theſe accounts the cold muſt increaſe. In ſummer the rays fall more perpendicularly upon us; come with greater force, and in greater numbers, on the ſame place; and by their long continuance, a much greater degree of heat is imparted by day, than can fly off by night.

(426.) Beſides, thoſe parts which are once heated, retain the heat for ſome time; which with the additional heat daily imparted, makes it continue to increaſe though the ſun declines towards the ſouth. This is the reaſon why July is hotter than June, and often, in our cold climate, Auguſt hotter than both, although the ſun has withdrawn from the ſummer tropic; as we find it is generally hotter at 3 in the afternoon, when the ſun has gone towards the weſt, than at noon when he is in the meridian. Thoſe places too which have been well cooled require time to be heated again; for the ſun's rays do not heat even the ſurface of any body, till they have been ſometime upon it. Hence we find January for the moſt part colder than December, although the ſun has withdrawn from the winter tropic, and begins to dart his beams more perpendicularly upon us. An iron bar is not heated immediately upon being put into the fire, nor grows cold till ſome time after it has been taken out.

(427.) The ſun completes what is called a TROPICAL YEAR, when he arrives at the ſame equinoctial or ſolſtitial point. This he does in 365 days, 5 hours, 48 minutes, 57 ſeconds. When he arrives at the ſame fixed ſtar again, as ſeen from the earth, he completes the SIDERIAL YEAR, which contains 365 days, 6 hours, 9 minutes, 14$\frac{1}{2}$ ſeconds. The ſiderial year is therefore 20 minutes 17$\frac{1}{2}$ ſeconds longer than the ſolar or tropical year, and 9 minutes, 14$\frac{1}{2}$ ſeconds longer than the Julian or the civil year, which we ſtate at 365 days 6 hours; ſo that the civil year is almoſt a mean between the ſiderial and tropical.

(428.) As the ſun deſcribes the whole ecliptic, or 360°, in a tropical year, he moves 59′ 8″ of a degree every day at a mean rate; and conſequently 50″ of a degree in 20 minutes 17$\frac{1}{2}$ ſeconds of time: therefore he will arrive at the ſame equinox or ſolſtice, when he is 50″ of a degree ſhort of the ſame ſtar or fixed point in the heavens, from which he ſet out the year before. So that, with reſpect to the fixed ſtars, the ſun and equinoctial points fall back (as it were) 30° in 2160 years, which will make the ſtars appear to have gone 30° forward with reſpect to the ſigns of the ecliptic in that time: for the ſame ſigns always keep in the ſame points of the ecliptic, without regard to the conſtellations.

(429.) The anticipation of the equinoxes, and conſequently of the ſeaſons, is not owing to the preceſſion of the equinoctial and ſolſtitial points in the heavens, (which can only affect the apparent motions, places, and declinations, of the fixed ſtars); but to the difference between the civil and ſolar year, which is 11 minutes 3 ſeconds; the civil year containing 365 days 6 hours, and the ſolar year 365 days 5 hours 48 minutes 57 ſeconds.

(430.) Theſe 11 minutes 3 ſeconds, by which the civil or Julian year exceeds the ſolar, amount to 11 days in 1433 years; and ſo much our ſeaſons had fallen back, with reſpect to the days of the months, ſince the time of the Nicene council in A. D. 325. In order, therefore, to bring back all the faſts and feſtivals to the days then ſettled, it was requiſite to ſuppreſs 11 nominal days: and, that the ſame ſeaſons might be kept to the ſame

times

times of the year, in future, to leave out the biſſextile day in February at the end of every century of years not diviſible by 4; to reckon them only common years; as the 17th, 18th, and 19th centuries, viz. the years 1700, 1800, 1900, &c. becauſe a day intercalated every fourth year was too much; and to retain the biſſextile day at the end of thoſe centuries of years which are diviſible by 4, as the 16th, 20th, and 24th centuries, viz. the years 1600, 2000, 2400, &c.

(431.) Without theſe changes, the ſeaſons in length of time, would be quite reverſed with regard to the months of the year; though it would have required near 23,783 years to have brought about ſuch a total change. If the earth had made exactly 365¼ diurnal rotations on its axis, whilſt it revolved from any equinoctial or ſolſtitial point to the ſame again, the civil and ſolar years would always have kept pace together, and the STYLE would never have needed any alteration.

SECT. IV. *Of the* PHÆNOMENA *of the* MOON.

(432.) The MOON is not a primary planet, but only a ſatellite, or attendant of the earth, circulating around it in 29 days, 12 hours, and 44 minutes, and round the ſun along with it every year. The moon's diameter is 2180 miles; and her diſtance from the earth's centre is 240,000. She goes round her orbit in 27 days, 7 hours, 43 minutes, moving about 2290 miles every hour; and turns round her axis exactly in the time that ſhe goes round the earth, which is the reaſon of her keeping always the ſame ſide towards us, and that her day and night taken together is as long as our lunar month.

(433.) The moon is an opaque globe like the earth, and ſhines only by reflecting the light of the ſun: therefore, whilſt that half of her which is towards the ſun is enlightened, the other half muſt be dark and inviſible. Hence ſhe diſappears when ſhe comes between us and the ſun; becauſe her dark ſide is then towards us. When ſhe is gone a little way forward, we ſee a little of her enlightened ſide: which increaſes to our view as ſhe advances, until ſhe comes to be oppoſite to the ſun; when her whole enlightened ſide is towards the earth, and ſhe appears a round illuminated orb, which we call the FULL MOON; her dark ſide being then turned away from the earth. From the full ſhe ſeems to decreaſe gradually as ſhe goes through the other half of her courſe; ſhowing us leſs and leſs of her enlightened ſide every day, till her next change or conjunction with the ſun, when ſhe diſappears as before.

(434.) The moon has ſcarce any difference of ſeaſons; her axis being almoſt perpendicular to the ecliptic. What is very ſingular, one half of her has no darkneſs at all; the earth conſtantly affording it a ſtrong light in the ſun's abſence; while the other half has a fortnight's darkneſs and a fortnight's light by turns.

(425.) Our earth appears as a *moon* to the inhabitants of the moon; waxing and waning regularly but appearing 13 times as big, and affording them 13 times as much light, as ſhe does to us. When ſhe changes to us, the earth appears full to her; and when ſhe is in her firſt quarter to us, the earth is in its third quarter to her; and *vice verſa*. But from one half of the moon the earth is never ſeen at all: from the middle of the other half, it is always ſeen over head; turning round almoſt 30 times as quick as the moon does. From the circle which limits our view of the moon, only one half of the earth's ſide next her is ſeen; the other half being hid below the horizon of all places on that circle. To her inhabitants the earth appears the largeſt body in the univerſe; for it appears 13 times as large as ſhe does to us.

(436.) While the earth turns round its axis, the ſeveral continents, ſeas, and iſlands, appear to the moon's inhabitants like ſo many ſpots of different forms and brightneſs, moving over its ſurface; but much fainter at ſome times than others, according as our clouds cover them. By theſe ſpots the Lunarians can determine the time of the earth's diurnal motion, juſt as we do the motion of the ſun: and they may meaſure their time by the motion of the earth's ſpots, for they cannot have a more true dial.

(437.) The axis of the moon is ſo nearly perpendicular to the ecliptic, that the ſun never removes ſenſibly from her equator; and the obliquity of her orbit, which is next to nothing as ſeen from the ſun, cannot cauſe the ſun to decline ſenſibly from her equator. Yet her inhabitants are not deſtitute of means for aſcertaining the length of their year, though their method muſt differ from ours. We know the length of our year by the return of our equinoxes; but the Lunarians, having always equal day and night, muſt have recourſe to another method; and we may ſuppoſe, they meaſure their year by obſerving when either of the poles of our earth begins to be enlightened, and the other to diſappear, which is always at our equinoxes: they being conveniently ſituated for obſerving great tracts of land about our earth's poles, which are entirely unknown to us. Hence we may conclude, that the year is of the ſame abſolute length to the inhabitants of the earth and moon, though very different as to the number of days; we having 365¼ natural days, and the Lunarians only 12¼, every day and night in the moon being as long as 29½ on the earth.

(438.) The inhabitants of the moon on the ſide next the earth, may find the *longitude* of their places, as eaſily as we can find the *latitude* of ours. For the earth keeping conſtantly, or very nearly ſo, over one meridian of the moon, the eaſt or weſt diſtances of places from that meridian are as eaſily found as we can find our diſtance from the equator by the altitude of our celeſtial pole.

(439.) As the ſun only enlightens that half of the earth which is towards him, and leaves the oppoſite half in darkneſs, he does the ſame to the moon, but with this difference, that as the earth is ſurrounded by an atmoſphere, we have twilight after the ſun ſets; but if the moon has neither an atmoſphere of her own, nor is included in that of the earth, (as is ſuppoſed) the Lunarians muſt have an immediate tranſition from the brighteſt ſun-ſhine to the blackeſt darkneſs.

(440.) The moon being an opaque ſpherical body (for her hills take off no more from her roundneſs, than the inequalities on the ſurface of an orange

ge take off from its roundneſs,) we can only that part of the enlightened half, which is to-ds the earth. And therefore, when the moon t A, See *Plate* XVI. *fig.* 3. in conjunction with ſun S, her dark half is towards the earth, and diſappears, as at *a*, there being no light on half to render it viſible. When ſhe comes to *firſt octant* at B, or has gone an eighth part of orbit from her conjunction, a quarter of her ghtened ſide is towards the earth, and ſhe ap-rs horned, as at *b*. When ſhe has gone a rter of her orbit from between the earth and to C, ſhe ſhows us one half of her enlightened e, as at *c*, and we ſay, ſhe is a *quarter* old. At ſhe is in her *ſecond octant*; and by ſhowing us re of her enlightened ſide, ſhe appears gibbous. at *d*. At E, her whole enlightened ſide is to-rds the earth; and therefore ſhe appears round, at *e*, when we ſay it is *full moon*. In her *third ant* at F, part of her dark ſide being towards earth, ſhe again appears gibbous, and is on decreaſe, as at *f*. At G, we ſee juſt one half her enlightened ſide; and ſhe appears half de-aſed, or in her third quarter, as at *g*. At H, only ſee a quarter of her enlightened ſide, be-in her *fourth octant*; where ſhe appears horn-as at *b*. And at A, having completed her rſe from the ſun to the ſun again, ſhe diſap-rs; and we ſay it is new moon. Thus, in go-from A to E, the moon ſeems continually to reaſe; and in going from E to A, to decreaſe the ſame proportion; having like phaſes at e-al diſtances from A to E, but as ſeen from the S ſhe is always full.

(441.) The moon does not appear perfectly und, when ſhe is full in the higheſt or loweſt rt of her orbit, becauſe we have not a full view her enlightened ſide at that time. When full the higheſt part of her orbit, a ſmall deficiency pears on her lower edge; and the contrary when ll in the loweſt part of her orbit.

(442.) From the figure, it is evident, that when e moon changes to the earth, the earth appears ll to the moon; and *vice verſa*. For when the oon is at A, new to the earth, the whole en-htened ſide of the earth is towards the moon; d when the moon is at E, full to the earth, its rk ſide is towards her. Hence a *new moon* an-ers to a *full earth*, and a *full moon* to a *new rth*. The quarters are alſo reverſed to each her.

(443.) The poſition of the moon's cuſps, or a ght line touching the points of her horns is very fferently inclined to the horizon, at diffe-rent ours of the ſame days of her age. Sometimes e ſtands, as it were, upright on her lower horn, d then ſuch a line is perpendicular to the hori-on: when this happens, ſhe is in what the aſtro-mers call *the nonageſimal degree*; which is the ighеſt point of the ecliptic above the horizon at at time, and is 90 degrees from both ſides of e horizon, where it is then cut by the ecliptic. ut this never happens when the moon is on the eridian, except when ſhe is at the very begin-ng of Cancer or Capricorn.

(444.) It is eaſy to demonſtrate, that the moon rns round her axis in the time that ſhe goes ound her orbit; for, a ſpectator at reſt, without the periphery of the moon's orbit, would ſee all her ſides turned regularly towards him in that time. She turns round her axis from any ſtar to the ſame ſtar again in 27 days 7 hours; from the ſun to the ſun again in 29½ days: the former is the length of her ſiderial day, and the latter the length of her ſolar day. A body moving round the ſun would have a ſolar day in every revolution, without turning on its axis; the ſame as if it had been at reſt, and the ſun moved round it: but without turning round its axis it could never have one ſiderial day, becauſe it would always keep the ſame ſide towards any particular ſtar.

(445.) If the earth had no annual motion, the moon would go round it ſo as to complete a lunation, a ſiderial, and a ſolar day, all in the ſame time. But, becauſe the earth goes forward in its orbit, while the moon goes round the earth in her orbit, the moon muſt go as much more than round her orbit, from change to change in completing a ſolar day, as the earth has gone forward in its orbit during that time, *i.e.* almoſt a twelfth part of a circle. If the earth had no annual motion, the moon's motion round the earth, and her track in open ſpace, would be always the ſame. But as the earth and moon move round the ſun, the moon's real path in the heavens is very different from her viſible path round the earth; the latter being in a progreſſive circle, and the former in a curve of different degrees of concavity; which would always be the ſame in the ſame parts of the heavens, if the moon performed a complete number of lunations in a year without any fraction.

(446.) To illuſtrate this, let the nail in the end of the axle of a chariot wheel repreſent the earth, and a pin in the nave the moon: If the body of the chariot be propped up ſo as to keep that wheel from touching the ground, and the wheel be then turned round by hand, the pin will deſcribe a circle both round the nail and in the ſpace it moves through. But if the props be taken away, the horſes put to, and the chariot driven over a piece of ground which is circulary convex; the nail in the axle will deſcribe a circular curve, and the pin in the nave will ſtill deſcribe a circle round the progreſſive nail in the axle, but not in the ſpace through which it moves. In this caſe, the curve deſcribed by the nail will reſemble in miniature as much of the earth's annual part round the ſun, as it deſcribes whilſt the moon goes as often round the earth as the pin does round the nail: and the curve deſcribed by the pin will have ſome reſemblance of the moon's path during ſo many lunations.

(447.) The ſurface of the moon being uneven, ſome are ſurpriſed that her edge does not appear jagged, as well as the curve bounding the light and dark places. But if we conſider, that what we call the *edge* of the moon's diſk is not a ſingle line ſet round with mountains, in which caſe it would appear irregularly indented, but a large zone, having many mountains, lying behind one another from the obſerver's eye, we ſhall find that the mountains in ſome rows will be oppoſite to the vales in others; and thus fill up the inequalities ſo as to make her appear quite round; juſt as when one looks at an orange, although its rough-neſs

nefs be very diſcernible on the ſide next the eye eſpecially if the ſun or a candle ſhines obliquely upon that ſide, yet the line terminating the viſible part ſtill appears ſmooth and even.

SECT. V. *Of the* TIDES.

(448.) The TIDES are found to follow periodically the courſe of the ſun and moon, and hence it has been ſuſpected, in all ages, that the tides were ſomehow produced by the influence of theſe luminaries. Of this, Pliny, Ptomely, Macrobius and others, ſeem to have had ſome knowledge. The celebrated KEPLER formed ſome conjectures long age, as to the true cauſe of the tides. "If, ſays he, the earth ceaſed to attract its waters towards itſelf, all the water in the ocean would riſe and flow into the moon. The ſphere of the moon's attraction extends to our earth and draws up the water." What Kepler only ſurmiſed, has been completely verified in the theory laid down by Newton, and by Halley, from his principles. The principal phænomena of the tides are as follow:

(449.) I. The ſea is obſerved to flow for about 6 hours from ſouth to north, gradually ſwelling; and after a flux of about 6 hours, it ſeems to reſt for a quarter of an hour; and then to ebb or retire back again from north to ſouth for 6 hours more. Then after a ſeeming pauſe of about $\frac{1}{4}$ of an hour, the ſea again begins to flow; and ſo on alternately.

(450.) II. Hence the ſea ebbs and flows twice a day, but falling every day later and later, by about 48 minutes, the period of a flux and reflux being on an average about 12 h. 24 min. and the double of each 24 h. 48 min. which is the period of a lunar day, or the time between the moon's paſſing a meridian, and coming to it again. So that the ſea flows as often as the moon paſſes the meridian, both the arch above the horizon, and that below it; and ebbs as often as ſhe paſſes the horizon, both on the eaſtern and weſtern ſide. Theſe are the moſt obvious appearances: The other phænomena are as follow:

(451.) III. The elevation towards the moon exceeds the oppoſite one a little, and the quantity of the aſcent of the water is diminiſhed from the equator to the poles.

(452.) IV. The ſun raiſes and depreſſes the ſea twice every day, in the ſame manner that the moon does; but the ſolar tides are much leſs than the lunar ones, although ſubject to the ſame laws.

(453.) V. The tides which depend upon the actions of the ſun and moon, are not diſtinguiſhed, but compound; and thus they form to appearance, one united tide, which increaſing, and decreaſing, produce NEAP and SPRING tides.

(454.) VI. In the ſyzygies the elevations from the action of both luminaries concur, and the ſea is more elevated; but the ſea aſcends leſs in the quadratures; for where the water is elevated by the action of the moon, it is depreſſed by that of the ſun, and vice verſa. Therefore, while the moon paſſes from the ſyzygy to the quadrature, the daily elevations are continually diminiſhed; on the contrary, they are increaſed, while the moon paſſes from the quadrature to the ſyzygy. At the new moon alſo *cæterus paribus* the elevations are greater; and thoſe that follow one another the ſame day, are more different than thoſe at full moon.

(455.) VII. The greateſt elevations and depreſſions take place on the 2d or 3d day after the new or full moon, and they are the greater, the nearer the luminaries are to the plane of the equator; being greateſt in the ſyzygies, near the equinoxes.

(456.) VIII. The actions of the ſun and moon are greater, the nearer thoſe bodies are to the earth; and the greateſt tides happen, when the ſun is a little to the ſouth of the equator: but this does not happen regularly every year, becauſe ſome variation may ariſe from the ſituation of the moon's orbit, and the diſtance of the ſyzygy from the equinox.

(457.) IX. The mean force of the moon, to move the ſea, is to that of the ſun nearly as 4 to 1; and therefore if the action of the ſun alone produce a tide of 2 feet, which it is ſaid to do; then that of the moon will be 9 feet, from which it follows, that the ſpring tides will be 11 feet, and the neap tides 7 feet. But ſuch elevations, as far exceed theſe, happen from the motion of the water againſt ſome obſtacles, and from the ſea violently entering ſtraits or gulfs, where the force is not broken till the water riſes higher.

(458.) The preceding phænomena take place in the open ſea, where the ocean is extended enough to be ſubject to their motions. But the particular ſituations of places, as to ſhores, capes, bays &c. diſturb in a conſiderable degree theſe general rules. We are now to ſhow how theſe phænomena may be explained, from the principal of univerſal gravitation.

(459.) If the earth were entirely fluid and coincent, its particles, by their mutual gravity towards each other, would form the whole maſs into the figure of an exact ſphere. If a power were to act on all the particles of this ſphere, with an equal force, and in parallel directions, the whole maſs would be moved together, but no change would be produced on its ſpherical figure, and its centre would have the ſame motion as each particle.

(460.) Upon this hypotheſis, if the motion of the earth, round the centre of gravity of the earth and moon, were deſtroyed, and the earth left to the influence of its gravitation towards the moon, as the power above mentioned, then the earth would fall or move ſtraight towards the moon, without changing its ſpherical figure.

(461.) But the fact is, that the effects of the moon's action, as well as the action itſelf on different parts of the earth, are not equal, the parts, by the general rules of gravity, being moſt attracted that are neareſt to the moon, and that being leaſt attracted that are fartheſt from her, while the parts, that are at a middle diſtance, are attracted by a mean degree of force; beſides, as the parts are not acted upon in parallel lines, but in lines directed towards the centre of the moon, on both which accounts, the ſpherical figure of the fluid earth muſt ſuffer ſome change from the action of the moon, ſo that in falling, as we have ſuppoſed, the nearer parts being moſt attracted would fall quickeſt, the farther parts being leaſt attracted

ted, would fall floweſt, and the fluid maſs
i be lengthened out, and take a kind of ſphe-
al form.

2.) Hence it appears, (which muſt be care-
obſerved,) that it is not the action of the moon
but the inequalities in that action, that cauſe
ariation from the ſpherical figure; and that
action were the ſame in all the particles, as
central parts, and operating in the ſame di-
n, no ſuch change would enſue.

3.) Let us now admit the parts of the earth
avitate toward its centre, then as this gravi-
n far exceeds the action of the moon, and
more exceeds the differences of her actions
ferent parts of the earth, the effect which re-
from the inequalities of theſe actions of the
n, will be only a ſmall diminution of the gra-
of thoſe parts of the earth, which it endea-
d in the former ſuppoſition to ſeparate from
ntre; that is, thoſe parts of the earth which
neareſt to the moon, and thoſe that are far-
from her, will have their gravity towards the
ſomewhat abated, to ſay nothing of the la-
parts; ſo that ſuppoſing the earth fluid, the
ans from the centre, to the neareſt, and to
fartheſt parts muſt riſe, till, by their greater
ht they be able to balance the other columns,
ſe gravity is leſs altered by the inequalities of
moon's action, and thus the figure of the
h muſt be an oblong ſpheroid.

464.) Let us now conſider the earth, inſtead of
ng toward the moon by its gravity, as pro-
ed in any direction, ſo as to move round the
tre of gravity of the earth and moon, it is evi-
t, that in this caſe the ſeveral parts of the fluid
h will ſtill preſerve that relative poſition, and
figure of the earth will remain the ſame as if
ll freely towards the moon; that is, the earth
l ſtill aſſume a ſpheroidical form, having its long-
axis directed toward the moon.

465.) From the preceding reaſoning, it ap-
rs, that the parts of the earth directly under
moon, as at H, (*Plate* XVII. *fig.* 4.) and alſo
oppoſite parts at D, will have the flood or
h water at the ſame time, while the parts at B
d F, at 90° diſtance, or where the moon ap-
ars in the horizon, will then have the ebbs, or
weſt waters. Hence as the earth turns round
axis from the moon to the moon again in 24 h.
m. this oval of water muſt ſhift with it, and
us there will be two tides of flood, and two of
b in that time. It farther appears, that by the
otion of the earth on her axis, the moſt elevated
rt of the water is carried beyond the moon, in
e direction of the rotation; ſo that the water
ntinues to riſe after it has paſſed directly under
e moon, though the immediate action of the
oon there begins to decreaſe; and comes not to
s greateſt elevation, till it has got about half a
adrant farther. It continues to deſcend after it
s paſſed at 90° from the point below the moon,
a like diſtance of half a quadrant.

(466.) The greateſt elevation, therefore, is not
the line drawn through the centres of the earth
nd moon, nor the loweſt points, where the moon
ppears in the horizon, but all theſe are removed
bout half a quadrant eaſtward from theſe points
the direction of the motion of rotation. Thus,
in open ſeas, where the water flows freely, the moon, M, is generally paſt the north and ſouth meridian, as at *p*, when the high water is at Z, and at *n*; the reaſon of which is plain, becauſe the moon acts with the ſame force after ſhe has paſſed the meridian, and thus adds to the libratory or waving motion which the water acquired, when ſhe was in the meridian.

(467.) Beſides, the tides anſwer not always to the diſtance of the moon from the meridian, at the ſame places, for the action of the ſun brings them on ſooner when the moon is in her 1ſt and 3d quarters, and keeps them back later when ſhe is in her 2d and 4th: becauſe, in the former caſe, the tide, raiſed by the ſun alone, would be earlier, than that raiſed by the moon, and in the latter caſe, later.

(468.) We have hitherto adverted only to the action of the moon in producing the tides, but it is evident, that for the ſame reaſons the inequality of the ſun's action, on different parts of the earth, would produce a like effect, and a like deviation from an exact ſpherical figure; ſo that in reality, there are two tides, every natural day, from the action of the ſun, as there are in a lunar day, from the action of the moon, ſubject to the ſame laws; and the lunar tide, as has been obſerved, is ſomewhat changed by the action of the ſun, the change varying every day, on account of the inequality between the natural and lunar day.

(469.) Although the gravitation of the earth, towards the ſun, is much greater than its gravitation towards the moon, yet, by reaſon of the ſun's immenſe diſtance, to which the earth's diameter bears a ſmall proportion, his action upon the ſide of the earth next to him differs but little, from that which is exerted on the ſide fartheſt from him, and it is only the inequalities in that action that produce the tide. However, the effect of the ſun is ſtill very ſenſible, but that of the moon is much more ſo; for by its proximity to the earth, there is a conſiderable inequality, both in the direction of its action, and in the intenſity of that action upon different parts of the earth.

(470.) Hence it is eaſy to ſee, that the tides muſt be greateſt at new and at full moon, becauſe the actions of the ſun and moon are then exerted in the ſame directions. Theſe are called SPRING TIDES; whereas, when the ſun and moon are 90° diſtant, the action of the one luminary raiſes the tides, juſt where that of the other depreſſes them, and thus are produced what are called NEAP TIDES. Newton has calculated the effects of the ſun and moon reſpectively upon the tides from their attractive powers, the former he finds to be to the force of gravity, as 1 to 12868200. To find the force of the latter upon the water, he compares the ſpring tides at the mouth of the river Avon, below Briſtol, with the neap tides, and finds the proportion as 9 to 5; whence, after ſeveral neceſſary corrections, he concludes, that the force of the moon, in moving the waters, is to that of the ſun, as 4·4815 to 1.

(471.) Dr Horſley, however, in his edition of Newton's *Principia*, eſtimates the force of the moon to that of the ſun, as 5·0469 to 1, and other authors have given different proportions; but Newton computes, from his proportion, that the

moon may raiſe the waters 9 feet, 1¼ inch, and the ſun and moon together may produce an elevation of about 11 feet, 2 inches, and about 12¾ feet, when the moon is at her neareſt diſtance. Now this is found by obſervation, to be nearly the height to which the water riſes, on the coaſts of the open and deep ocean.

(472.) It muſt be obſerved, that the ſpring tides do not happen preciſely at new and full moon, nor the neap tides preciſely at the quarters, but a day or two after, becauſe, as in other caſes, ſo in this, the effect is not greateſt or leaſt, when the immediate influence of the cauſe is greateſt or leaſt, for if the actions of the ſun and moon were to ceaſe, yet the tides would continue for ſome time; as the waves of the ſea continue their motion after a ſtorm.

(473.) The different diſtances of the moon from the earth produce a ſenſible variation in the tides; and Newton has ſhewn, that they increaſe as the cubes of the diſtances decreaſe; ſo that the moon at half her diſtance, would produce a tide 8 times greater. The moon deſcribes an oval round the earth; and at her neareſt diſtance, produces a tide, ſenſibly greater than at her fartheſt diſtance. Hence two great ſpring tides never ſucceed each other, at the diſtance of 14 days; for if the moon be at her leaſt diſtance at the change, and therefore produce a great ſpring tide, ſhe will be at her greateſt diſtance at the full, and therefore the ſpring tide will be leſs.

(474.) The ſpring tides are higheſt, and the neap tides loweſt, about the time of the equinoxes; becauſe, were the ſun or moon in the pole of the world, there would be no tide; for their action would raiſe the water at the equator or any parallel, equally round the earth: therefore, the nearer they are to the equator, the greater muſt be the effect. When the ſun and moon traverſe the equator, the tides, which are under them, will traverſe the greateſt circle, and the waters will be put into the greateſt agitation. They will alſo be the greater at theſe times, becauſe the earth is nearer to the ſun, about the beginning of March and end of September, than in the ſummer months.

(475.) As the greateſt of the two tides, happening in every diurnal revolution of the moon, is that in which the moon is neareſt the zenith or nadir, therefore, while the ſun is in the northern ſigns, the greater of the two diurnal tides, in our climate, will be that ariſing from the moon when above the horizon; and when the ſun is in the ſouthern ſigns the greateſt is that ariſing from the moon below the horizon. Thus, the evening tides in ſummer exceed the morning tides, and the morning tides in winter exceed the evening tides. This difference is found at Briſtol, to be 15 inches, and at Plymouth 12 inches.

(476.) Such would the tides regularly be, if the earth were all covered over with the ſea, to a great depth, ſo that the waters might freely follow the influence of the ſun and moon; but, as the tides paſs over ſhoals, and run through ſtraits into bays of the ſea, their motion becomes more various, and their height depends upon a great many circumſtances. That the tides may have their full motion, the ocean, in which they are produced, ought to be at leaſt 90° extended from eaſt to weſt; becauſe that is the diſtance between the greateſt elevation, and the greateſt depreſſion produced in the waters by the moon.

(477.) Hence it appears, that it is only in the great oceans that ſuch tides as we have deſcribed can be produced, and why in the larger Pacific ocean they exceed thoſe in the Atlantic ocean.—Hence it is obvious why the tides are not ſo great in the torrid zone, between Africa and America, where the ocean is narrower, as in the temperate zones on either ſide; and hence alſo, we ſee why the tides are ſo ſmall in iſlands, at great diſtances from the ſhores. It likewiſe appears, that the waters cannot riſe on one ſhore of the Atlantic ocean, but by deſcending on the other, ſo that at the intermediate iſlands, it muſt remain at a mean height, between its elevations on thoſe two ſhores.

(478.) The tides, that enter the mouths of rivers from the ocean, are greatly retarded in their progreſs, by the currents of the rivers. Mr Condamine, while in South America, obſerved, that in the river Amazon, there were 5 high waters, and 4 intermediate low waters at once; and a ſimilar circumſtance takes place in the Thames.—For the tide, propagated by the moon in the German ocean, when ſhe is 3 hours paſt the meridian, takes 12 hours longer to come to London Bridge, ſo that when it is high water there, a new tide is already come to its height in the ocean, and in ſome intermediate place, it muſt be low water at the ſame time.

(479.) At ſeveral places, it is high water three hours before the moon comes to her meridian; but that tide, which the moon puſhes as it were before her, is only the tide oppoſite to that which was raiſed by her, when ſhe was 9 hours paſt the oppoſite meridian.

(480.) There are no ſenſible tides in the Baltic, the Mediterranean, or the Black Seas; for they communicate with the ocean, by ſuch narrow inlets, and are of ſo immenſe an extent, that they cannot ſpeedily receive and empty water enough, to raiſe or depreſs their ſurfaces ſenſibly. In the Caſpian Sea, and in lakes, &c. the moon's attraction is nearly the ſame upon all parts of their ſurface, ſo that no ſenſible ſwelling can take place in their waters.

(481.) We may alſo conclude, that by reaſon of the fluidity of the atmoſphere, it muſt have tides ſimilar to thoſe of the ocean; and hence there will be a general current from eaſt to weſt both of the waters of the ocean, and of the air; but the changes produced in the ſtate of the atmoſpere, from chemical cauſes, will ſo much affect the general current, as to prevent it from being perceived.

SECT. VI. *Of the* HARVEST MOON.

(482.) It is remarkable, that the moon during the week in which ſhe is full about the time of harveſt, riſes ſooner after ſun-ſetting, than ſhe does in any other full moon week throughout the year. By this means, ſhe affords an immediate ſupply of light after ſunſet, which is very beneficial for thoſe employed in the harveſt, in gathering in the fruits of the earth. Hence this

on is diſtinguiſhed from all others in the year, calling it the HARVEST MOON.

(483.) To conceive the reaſon of this phæno-non, it may firſt be conſidered, that the moon always oppoſite to the ſun, when ſhe is full, d therefore, in the harveſt months, ſhe is full Piſces and Aries, which are oppoſite to Virgo d Libra, the ſigns occupied by the ſun about e ſame ſeaſon. Now, the ſigns Piſces and Ari-riſe in a ſhorter ſpace of time than others, as eaſily ſhewn and illuſtrated by a celeſtial globe; d the ſame thing may be conceived from this cumſtance, that in northern latitudes, the ſmal-t angle, made by the ecliptic and horizon, is hen Aries riſes, at which time Libra ſets; and it obvious, that the ſmaller the angle contained the ecliptic and horizon, the greater portion the ecliptic will riſe by the earth's rotation, in given time. Conſequently, when the moon is l in harveſt, ſhe riſes with leſs difference of me, or more immediately after ſun-ſet, than at y other ſeaſon of the year.

(484.) In our winter, the moon is in Piſces d Aries, about the time of her firſt quarter, hen ſhe riſes about noon, and therefore, her ri-ng is not then noticed.

(485.) In ſpring, the moon is in Piſces and A-es about the time of her change, but as ſhe then ives no light, and riſes with the ſun, her riſing annot be perceived.

(486.) In ſummer, the moon is in Piſces and ries at the time of the laſt quarter, and then as e does not riſe till midnight, her riſing uſually aſſes unobſerved.

(487.) But in autumn, the moon is in Piſces nd Aries, at the time of her full, and riſes ſoon fter ſun-ſet, for ſeveral evenings ſucceſſively; vhich makes her regular riſings very conſpicuous, t that time of the year.

(488.) All this would happen, if the moon's rbit lay in the ecliptic; but her orbit makes with he ecliptic an angle of 5° 18′ and croſſes it in wo points, called her *nodes*; ſo that her riſing when in Piſces and Aries, will ſometimes not dif-er above an hour and 40 minutes, through a whole week; and at other times, in the ſame two igns ſhe will differ in a week 3¼ hours, in the ime of her riſing, according to the different po-ſitions of the nodes, with reſpect to the ſigns; which poſitions are always changing, becauſe the nodes go backward through the ecliptic, in 18 years, 225 days.

(489.) This revolution of the nodes cauſes the harveſt moons to go through a whole courſe of the moſt advantageous and leaſt beneficial ſtates, with reſpect to the harveſt, every 19 years. They are leaſt beneficial at preſent, in 1796, and will be ſo, in 1797; after which, they will be moſt beneficial from that period to 1806. In 1807 they again become leaſt beneficial, and continue ſo till 1815. Their moſt advantageous period begins again in 1816, and laſts till 1825, when the oppoſite period commences, and laſts to 1834; and again they are moſt beneficial from 1835, to 1843, and ſo on.

SECT. VII. *Of the* HORIZONTAL SUN *and* MOON.

(490.) Philoſophers have been much at a loſs to account for the apparent magnitude of the ſun and moon, being greater when they are in the horizon, than when elevated above it. For according to the laws of viſion, they ſhould appear leaſt, when neareſt the horizon, becauſe they are then fartheſt from the eye; and yet, it is found, that the contrary is true, in fact. Thus, although the diameter of the moon, when in the horizon, as meaſured by an inſtrument, is not found to be greater than when meaſured at her greateſt elevation in the meridian, yet her *apparent* diameter, when in the horizon, ſeems to the eye, 2 or 3 times greater than when ſhe is conſiderably elevated above it.

(491.) According to ALHAZEN, one of the earlieſt writers on optics, the ſight apprehends the ſurface of the heavens as flat, and judges of the ſtars, as it would of ordinary objects extended upon a wide plain. The eye ſees them indeed under equal angles, but at the ſame time perceives a difference in their diſtances, and (on account of the ſemidiameter of the earth, which is interpoſed in the one caſe, but not in the other) it is hence induced to judge thoſe that appear more remote to be greater.

(492.) DES CARTES, and from him Dr WALLIS and moſt other authors, account for the appearance of a different diſtance under the ſame angle, from the long ſeries of objects interpoſed between the eye and the extremity of the horizon, which makes us imagine it is more remote than when in the meridian, where the eye ſees nothing in the way between itſelf and the object. This idea of a great diſtance makes us imagine the luminary larger; for an object being ſeen under any certain angle, and believed at the ſame time more remote, we naturally imagine it to be very large, to appear under ſuch an angle at ſuch a diſtance, and thus a pure judgment of the mind makes us ſee the ſun or the moon larger in the horizon than in the meridian, notwithſtanding their diameters, when meaſured, are really leſs in the former ſituation than in the latter.

(493.) This opinion, however, ſeems hardly tenable, although it be ſanctioned by the authority of very eminent men; for it is daily ſeen, that the ſun and moon, when near the horizon, very ſuddenly change their magnitude as they aſcend and deſcend, though all the intervening objects remain the ſame as before; and the luminaries appear largeſt of all, when feweſt objects appear on the earth, as in a thick fog or miſt.

(494.) Dr DE AGULIERS has illuſtrated the doctrine of the horizontal moon, upon the ſuppoſition that we imagine the viſible heavens to be only a ſmall portion of a ſpherical ſurface, and conſequently ſuppoſe the moon to be farther from us in the horizon than near the zenith; and he has demonſtrated how liable we are to ſuch deceptions.

(495.) Upon this idea, Dr SMITH has determined, in his optics, that the centre of the apparent ſpherical ſegment of ſky, lying much below the eye, the apparent diſtance of its parts, near the horizon, was about 3 or 4 times greater than the apparent diſtance of its parts over head; for which reaſon it is, he infers, that the moon always appears larger as ſhe is lower, and alſo that

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we always think the height of a celeſtial object to be greater than it really is.

(496.) Of the apparent figure of the ſky, we ſhall have occaſion to treat more fully under OPTICS; and ſhall only obſerve here, that if it be allowed, that we judge of the apparent magnitude of the heavenly bodies, by the arc which they cover of the concave ſky, it is evident, ſince the ſky appears to us as a ſegment leſs than a hemiſphere, that the horizon will appear farther diſtant than the zenith; and therefore the ſun and moon, while in the horizon, will cover a larger portion of the apparent ſky, than when more elevated, and thus their apparent diameter will be greater.

SECT. VIII. *Of the* REFRACTION *of* LIGHT *by the* ATMOSPHERE.

(497.) If it were not for the atmoſphere, the rays of light that come from the heavenly bodies, and by which they are ſeen, would enter the eye in the direction of a ſtraight line joining the luminous body and the eye. But the earth being covered to a conſiderable height with an atmoſphere of unequal denſity, a ray of light falling obliquely upon its ſurface, inſtead of continuing to move forward in the ſame rectilineal direction, is bent downwards into a curve, in its future progreſs; and enters the eye in a direction differing more or leſs from its original one, according as it falls upon the atmoſphere, with a greater or leſs degree of obliquity.

(498.) This effect may be thus illuſtrated. Suppoſe ZY, Plate XXVIII, fig. 5, a quadrant of a vertical circle deſcribed from the centre of the earth T, under which is AB a quadrant of a circle on the ſurface of the earth, and GH a quadrant of the ſurface of the atmoſphere. Then ſuppoſe SE a ray of light emitted from a ſtar at S, and falling on the atmoſphere at E; becauſe the ray paſſes out of a rare medium (and moſt probably a perfect vacuum) into a denſer medium; by the laws of optics, it will be refracted towards the perpendicular, or more inclined towards the earth; and ſince the farther that a ray deſcends in the atmoſphere, the more denſe is the medium through which it paſſes, it will move in the curve EA, and at laſt enter the eye in the direction of AFQ, a tangent to the curve. Therefore the ſtar will appear at Q inſtead of S, and thus its apparent place Q will be nearer the zenith than its true place.

(499.) The nearer the ſtar S is to the horizon, the greater will be the refraction as well as the diſtance between the apparent and true place of the ſtar. Hence the heavenly bodies appear to be *above* the horizon, by reaſon of the refraction, when they are really *below* it. There is no refraction in the zenith, for a ray, coming from Z, will fall perpendicularly on the ſurface of the atmoſphere at G, and continue its rectilinear courſe to the eye at A.

(500.) This refraction of the light by the atmoſphere, produces the TWILIGHT, for while the ſun is leſs than 18° below the horizon, his rays, although prevented from reaching us directly, by reaſon of the interpoſed body of the earth; yet fall upon the ſuperior regions of the atmoſphere, and are ſo refracted and reflected by its particles, as to produce a brightneſs over the horizon, which continues through the whole night during the ſummer months, in the regions of the earth towards the poles.

(501.) The rays of light are equally refracted by the atmoſphere, whether they come from the ſun, the moon, or the ſtars; but the quantity of the refraction, and therefore the duration of the twilight, are influenced by the changes which are perpetually taking place with reſpect to the heat and cold, the moiſture and dryneſs, &c. of the atmoſphere.

PART IV.

ASTRONOMICAL OPERATIONS AND CALCULATIONS.

SECT. I. *Of* DRAWING *a* MERIDIAN LINE.

(502.) Upon a plain board, ſet parallel to the horizon, deſcribe a circle ABF, as in Plate XVII. fig. 6. And upon the centre, C, erect a ſtile or gnomon, exactly perpendicular to it, and ſo high, that the top of the ſhadow thereof may fall upon the circumference of the circle about the middle of the forenoon. Mark the point B exactly where the top of the ſhadow falls in the forenoon; and mark the point F where the top of the ſhadow falls on the circumference, in the middle of the afternoon. Then through the centre C, draw the line ACD, biſecting the arch BF. The AD is the meridian required.

(503.) It is proper to draw ſeveral concentric circles, and to make obſervations with them all, that they may confirm one another. If the ſun happens to be clouded in one, it may be clear in another. It is beſt to make theſe obſervations about the ſolſtices, when the ſun does not alter his declination ſenſibly; and the ſummer ſolſtice is to be preferred.

(504.) The ſun is evidently higheſt when in the meridian; and at equal diſtances therefrom has equal altitudes. Therefore, when the diſtances DB, DF are equal, the ſhadows CB, CF will be equal, and therefore the altitudes equal. And *vice verſa*.

(505.) II. Hang up two threads and plummets AB, CD, Plate XXVIII. fig. 12. at a good diſtance, in veſſels of water, to keep them ſteady; of which CD is moveable towards the left and right, upon a pin C. Wait till the polar ſtar, E, and the ſtar Allioth, F, (in the great bear's rump), come into the ſame plumb line, AB, to an eye placed at I. At that inſtant (or rather before) move the thread CD alſo into the ſame line; ſo that the thread CD may hide the thread AB, and the polar ſtar E from the eye at I. Then the plane ABCD is the place of the meridian; and where it interſects the horizontal plane, is the meridian line. And the ſame may be done with the ſtar, called Caſſiopeia's hip. To take away the ſtar's rays, look through a ſmall hole in a thin plate. This muſt be performed in a calm place.

(506.) If it is wiſhed to have a meridian drawn in ſome other place, let the threads and plummets AB, CD, remain; and hang up two others as, *cd*, in the place propoſed, as in fig. 13, letting *ab* be moveable upon a pin at *a*. Then wait till any ſtar, as G, comes into the plane ABCD to the

eye

ye, at H; and at that inſtant, move the thread *ab*, till the ſame ſtar G fall in the plane *abcd*, to the eye at *b*; then *abcd* is the plane of the meridian. This is beſt done by help of an aſſiſtant. This method will in time deviate a little from the truth, occaſioned by the ſtars changing their places; but that change is very inconſiderable for ſeveral years.

(507.) III. Having a clock or watch, with minutes and ſeconds, find the northing of the ſtar, Alioth, F, (fig. 12.) by the aſtronomical tables; and wait till the polar ſtar E is in a plumb line with F. At that inſtant, ſet the clock to the ſaid time of northing. And next day at 12 o'clock, draw a meridian line, by the ſhadow of a plumb line hung in the ſun. Or find the time of ſouthing of any other ſtar, as G, and the clock remaining as before, when ſhe ſhews the time of ſouthing, place the threads *ab*, *cd*, (Fig. 13.) ſo that the line *Gb* may paſs through them both. Then *abcd* will be in the plane of the meridian.

SECT. II. *Of* FINDING TIME, *and the* EQUATION *of* TIME.

(508.) Having drawn a meridian line as directed in laſt article, the time when the ſun, or any other celeſtial body is exactly in the meridian, may be found by a common quadrant, placing the edge of it along the line, and obſerving when the ſun or other luminary can be ſeen exactly through its two ſights, and noting exactly the time; which ſuppoſing the luminary viewed to be the ſun, will be preciſely noon, or 12 o'clock: but as the apparent diameter of the ſun is pretty large, it ought to be known exactly when his centre is in the meridian, which will be ſome ſhort ſpace after his eaſtern limb has arrived at it, and before his weſtern limb comes thither. It will be proper, therefore, to obſerve exactly the time of the two limbs being ſeen through the ſights of the quadrant; and the half of the difference between theſe times, added to the one or ſubtracted from the other, will give the exact time when the ſun's centre is in the meridian.

(509.) The ſame method is equally applicable to the moon; but not to the ſtars, which have no ſenſible diameter. It is found, by obſervation, that the ſtars appear to go round the earth in 23 hours 56 minutes 4 ſeconds, and the ſun in 24 hours; ſo that the ſtars gain 3 minutes 56 ſeconds upon the ſun every day, which amounts to one diurnal revolution in a year; and therefore, in 365 days, as meaſured by the returns of the ſun to the meridian, there are 366 days as meaſured by the ſtars returning to it: the former are called SOLAR DAYS, and the latter SIDERIAL.

(510.) If the earth had no annual motion, but only a diurnal, any given meridian would revolve from the ſun to the ſun again, in the ſame quantity of time as from any ſtar to the ſame ſtar again; becauſe the ſun would never change his place with reſpect to the ſtars. But, as the earth advances almoſt a degree eaſtward in its orbit, in the time that it turns eaſtward round its axis, whatever ſtar paſſes over the meridian on any day with the ſun, will paſs over the ſame meridian on the next day, when the ſun is almoſt a degree ſhort of it; that is, 3 minutes 56 ſeconds ſooner. If the year contained only 360 days, as the ecliptic does 360 degrees, the ſun's apparent place, ſo far as his motion is equable, would change a degree every day; and then the ſiderial days would be juſt 4 minutes ſhorter than the ſolar.

(511.) As the motion of the earth round its axis is perfectly uniform and equal at all times of the year, the ſiderial days are always preciſely of an equal length; and ſo would the ſolar or natural days be, if the earth's orbit were a perfect circle, and its axis perpendicular to its orbit. But the earth's diurnal motion on an inclined axis, and its annual motion in an elliptic orbit, cauſe the ſun's apparent motion in the heavens to be unequal: for ſometimes he revolves from the meridian to the meridian again in ſomewhat leſs than 24 hours, ſhown by a well-regulated clock; and at other times in ſomewhat more: ſo that the time ſhown by a good clock and a true ſun-dial is never exactly the ſame, but on the 15th of April, the 16th of June, the 31ſt of Auguſt, and the 24th of December.—The clock, if it goes equably and true all the year round, will be before the ſun from the 24th of December till the 15th of April; from that time till the 16th of June, the ſun will be before the clock; from the 16th of June till the 31ſt of Auguſt, the clock will be again before the ſun; and from thence to the 24th of December, the ſun will be faſter than the clock.

(512.) The equation of time, therefore, or difference between the time ſhown by a well regulated clock and a true ſun dial, depending upon two cauſes, viz. the obliquity of the ecliptic, and the unequal motion of the earth in it, the united effects, reſulting from their combination, may be explained in the following manner.

(513.) Let Z ♈ ♎, in PLATE XXIX. fig. 1. be the earth; ZFR ♎, its axis; *abcde*, &c. the equator; ABCDE, &c. the northern half of the ecliptic from ♈ to ♎ on the ſide of the globe next the eye; and MNOP, &c. the ſouthern half on the oppoſite ſide from ♎ to ♈. Let us ſuppoſe a fictitious ſun to ſet out from ♈, at the ſame inſtant with the real ſun. Let the points at A, B, C, D, E, F, G, &c. quite round, from ♈ to ♈ again, bound equal portions of the ecliptic, gone through in equal times by the real ſun; and thoſe at *a*, *b*, *c*, *d*, *e*, *f*, *g*, &c. equal portions of the equator deſcribed in equal times by the fictitious ſun; and let Z ♈ ♎ be the meridian.

(514.) As the real ſun moves obliquely in the ecliptic, and the fictitious ſun directly in the equator, with reſpect to the meridian; a degree, or any number of degrees, between ♈ and F on the ecliptic, muſt be nearer the meridian Z ♈ ♎, than a degree, or any correſponding number of degrees, on the equator from ♈ to *f*; and the more ſo, as they are the more oblique: and therefore the true ſun comes ſooner to the meridian every day, whilſt he is in the quadrant ♈ F, than the fictitious ſun does in the quadrant ♈ *f*; for which reaſon, the ſolar noon precedes noon by the clock, until the real ſun comes to F, and the fictitious to *f*; which two points, being equidiſtant from the meridian, both ſuns will come to it preciſely at noon by the clock.

(515.) While the real ſun deſcribes the ſecond quadrant of the ecliptic FGHIKL, from Cancer to

♎, he comes later to the meridian every day, than the fictitious ſun moving through the ſecond quadrant of the equator, from *f* to ♎; for the points at G, H, I, K, and L, being farther from the meridian, their correſponding points at *g*, *h*, *i*, *k*, and *l*, muſt be later of coming to it: and as both ſuns come at the ſame moment to the point ♎, they come to the meridian at the moment of noon by the clock.

(516.) In departing from Libra, through the 3d quadrant, the real ſun going through MNOPQ towards ♑ at R, and the fictitious ſun through *mnopq* towards *r*, the former comes to the meridian every day ſooner than the latter until the real ſun comes to ♑, and the fictitious to *r*, and then they come both to the meridian at the ſame time. Laſtly, as the real ſun moves equably through STUVW, from ♑ towards ♈; and the fictitious ſun through *stuvw*, from *r* towards ♈, the former comes later every day to the meridian than the latter, until they both arrive at the point ♈, and then they make it noon at the ſame time with the clock.

(517.) We now proceed to explain the other cauſe of this difference, viz. the inequality of the ſun's apparent motion, which is ſloweſt in ſummer, when the ſun is fartheſt from the earth, and ſwifteſt in winter when he is neareſt to it.

(518.) As the real ſun moves unequably in the ecliptic, let us ſuppoſe a fictitious ſun to move equably in a circle coincident with the plane of the ecliptic. Let ABCD in PLATE XXIX. fig. 2. be the ecliptic or orbit in which the real ſun moves, and the dotted circles *abcd* the imaginary orbit of the fictitious ſun: each going round in a year according to the order of letters, or from weſt to eaſt. Let HIKL be the earth turning round its axis the ſame way every 24 hours; and ſuppoſe both ſuns to ſtart from A and *a*, in a right line with the plane of the meridian EH, at the ſame moment: the real ſun at A, being then at his greateſt diſtance from the earth, at which time his motion is ſloweſt; and the fictitious ſun at *a*, whoſe motion is always equable, becauſe his diſtance from the earth is ſuppoſed to be always the ſame. In the time that the meridian revolves from H to H again, according to the order of the letters HIKL, the real ſun has moved from A to F; and the fictitious with a quicker motion from *a* to *f*, through a large arc: therefore, the meridian EA will revolve ſooner from H to *h* under the real ſun at F, than from H to *k* under the fictitious ſun at *f*; and conſequently it will then be noon by the ſun-dial ſooner than by the clock.

(519.) As the real ſun moves from A towards C, the ſwiftneſs of his motion increaſes all the way to C, where it is at the quickeſt. But notwithſtanding this, the fictitious ſun gains ſo much upon the real, ſoon after his departing from A, that the increaſing velocity of the real ſun does not bring him up with the equally moving fictitious ſun, till the former comes to C, and the latter to *c*, when each has gone half round its reſpective orbit; and then being in conjunction, the meridian EH, revolving to EK, comes to both ſuns at the ſame time, and therefore it is noon by them both at the ſame moment.

(520.) But the increaſed velocity of the real ſun, now being at the quickeſt, carries him before the fictitious one; and therefore, the ſame meridian will come to the fictitious ſun ſooner than to the real: for whilſt the fictitious ſun moves from *c* to *g*, the real ſun moves through a greater arc from C to G: conſequently the point K has its noon by the clock when it comes to *k*, but not its noon by the ſun till it comes to *l*. And although the velocity of the real ſun diminiſhes all the way from C to A, and the fictitious ſun by an equable motion is ſtill coming nearer to the real ſun, yet they are not in conjunction till the one comes to A and the other to *a*, and then it is noon by them both at the ſame moment.

(521.) Thus it appears, that the ſolar noon is always later than noon by the clock, whilſt the ſun goes from C to A; ſooner, whilſt he goes from A to C; and at theſe two points the ſun and clock being equal, it is noon by them both at the ſame moment. Upon theſe principles tables for the equation of time are calculated, the one giving the difference between the ſun's true and mean motion; the other the difference between the ſun's longitude and right aſcenſion; from which the arc is calculated by addition or ſubtraction. But the calculation cannot, from the preceſſion of the equinoxes, be depended upon for a conſiderable length of time.

SECT. III. *Of* CALCULATING *the* DISTANCES, MAGNITUDES, &c. *of the* CELESTIAL BODIES.

(522.) Theſe are obtained by finding out the horizontal parallax of the body whoſe diſtance is deſired to be known; that is, the angle under which the ſemidiameter of the earth would appear provided we could ſee it from that body. In general the parallax of a planet is the difference between the real and apparent place of a planet; that is, between its place ſeen from ſome part of the ſurface, and from the centre of the earth; ſo that the parallax is the angle under which the ſemidiameter of the earth, terminated by the place of an obſerver, is ſeen at the planet; and to find this parallax many methods have been deviſed.

(523.) I. Let AD, PLATE XXIX. fig. 3. be the earth, C its centre, P the planet; and let the planet's diſtance CP from the centre of the earth be given. Then ZAP is the complement of the apparent altitude, ZCP the complement of the true altitude. As the planet's diſtance from the centre of the earth CP: to the earth's radius AC:: ſo is the coſine of the apparent altitude, S.ZAP. to the ſine of the parallax. For draw AF parallel to CP. The angle FAP is equal to the angle APC. But ZAF is equal to ZCP, the true zenith diſtance, and ZAP is the apparent zenith diſtance; and their difference FAP, or its equal APC is the parallax. But in the triangle CAP, as is CP: S.CAP or ZAP:: CA: S.CPA, or PAF, the parallax.

(524.) II. If the diſtances of two planets or ſtars, having the ſame apparent altitude, be known, and the parallax of one of them.—Let P and G be the planets in the line APG; then APC is the parallax of P, and AGC the parallax of G. Therefore in the triangle CPC, we have CP, CG, and an angle oppoſite, ſuppoſe G, to find the other oppoſite

ppoſite angle. Therefore diſtance C P : diſtance G : : S. C G P : S. C P G or C P A; that is, the ines of the parallaxes are reciprocally as the diſances from the earth's centre.

(525.) III. Let S be the ſtar or planet, whoſe arallax is ſought. See *Plate* XXIX. *fig.* 4. Oberve it when it is in the ſame vertical circle with ny two fixed ſtars, A, B. Obſerve again when he ſame two ſtars come into a poſition parallel to he horizon at *a* and *b*; and let the planet be come o *s*. Then with an inſtrument meaſure the altiude of *a* or *b*, and likewiſe the altitude of *s*; and he difference of theſe altitudes is the parallax. 'or the real place of the ſtar S is ſomewhere in he line A B, and therefore it is alſo ſomewhere in he line *a b*, and therefore its altitude is the ſame s that of *a* or *b*. Therefore the parallax is the ifference of the altitudes of *a* and *s*, or of *b* and *s*.

(526.) IV. Let S be the ſtar or planet; obſerve :s diſtance from any fixed ſtar B, which is in the ime vertical circle Z S B; and meaſure the diſance S B with an inſtrument. Then obſerve aain when the ſame two ſtars have equal altitudes bove the horizon, at *b* and *s*, and then take the iſtance *b s*. This diſtance will be very near the rue diſtance of the ſtars B and S; therefore the rſt diſtance B S ſubtracted from the latter diſtance *s*, when B is below S, gives the parallax; or the itter diſtance ſubtracted from the former, when is above S, gives the parallax.

(527.) V. The parallax may be found by obſering the azimuth and altitude of the ſtar or planet. et H Z O, *Plate* XXIX. *fig.* 5. be the meridian, Q the equinoctial, H O the horizon, Z the zeith, P the pole, S the ſtar, Z S B a vertical circle aſſing through it. Obſerve the altitude B S, and ie azimuth B O, and mark the moment of time hen theſe obſervations are made; then obſerve ie moment of time that the ſtar comes to the ieridian, and then you have the diſtance of time om the obſervations. Convert this into degrees, llowing only 23 hours 56 minutes to 360 degrees which is the time of the earth's rotation to the me ſtar), and you have the arch E D or angle P A, ſuppoſing P A D an hour circle. Therere in the ſpherical triangle Z P A, we have the anle Z P A, and angle P Z A equal to B O, and the de Z P the co-latitude, to find the ſide Z A the omplement of the altitude; this ſubtracted from . S, known by obſervation, the remainder A S is ie parallax.

(528.) VI. Another method is performed by a leſcope, with croſs hairs in the focus. Direct ie teleſcope to the planet, and turn it round till s motion is along one of the croſs hairs, which preſents part of the planet's parallel circle; and ie other hair perpendicular to it, will repreſent s hour circle. Obſerve the time when the planet omes to this hour circle, there fix the teleſcope, id then take its altitude; then obſerve the time hen ſome fixed ſtar, whoſe right aſcenſion is nown, comes to the ſame hour circle. The difrence of time between the planet and ſtar coing to this hour circle, turned into degrees (alwing 360 degrees to 23 hours, 56 minutes), gives e difference of right aſcenſions of the planet and ar; and ſo the apparent right aſcenſion of the lanet is known.

(529.) When the planet comes to the meridian, obſerve it with the teleſcope, and note the time; and when the ſtar comes to the meridian, note the time of that: then the difference of the times reduced to degrees as before, gives the true difference of right aſcenſions, ſo the true right aſcenſion of the planet will be known. Therefore let H O, *Plate* XXIX. *fig.* 6. be the horizon, H Z O the meridian, Z the zenith, P the pole, A the true place of the planet, S its apparent place, Z S B a vertical circle; then in the triangle Z P S, we have Z P, Z S, and angle Z P S to find the angle P Z S. In the triangle Z P A, we have Z P, angles Z P A, P Z A; to find Z A, which taken from Z S, gives A S the parallax.

(530.) If the planet have a proper motion of its own, its true place will be always changing; and therefore the change of place muſt be computed for the time of the obſervations. This is done by obſerving its place when in the meridian, twice; and thence the change of place is had for 24 hours; and therefore the place at the times of obſervations will be had by proportioning the motion according to the times. Here the angle Z P S ſhould be about 90°, to have A P S the greateſt poſſible.

(531.) VII. The operation repreſented in *Plate* XXIX. *fig.* 7. requires two obſervers in different places of the earth, and can be applied to none of the planets but MARS in oppoſition to the Sun, or to VENUS on the Sun's diſk. It is beſt performed when the Sun is about the equinox. Let P E R Q be the earth, P R its axis, E Q the equinoctial, S the planet Mars in oppoſition to the Sun, and if near the perihelion, it is better. Let two places, F, G, be taken, the one in N. lat. the other in S. lat. the further from the equinoctial the better; and nearly in the ſame meridian, or rather ſo placed, that the line F G, drawn from the one to the other, may be nearly perpendicular to the orbit of Mars. By this there is a greater baſe to work upon. Then let the two obſervers pitch upon ſome fixed ſtar as A, which Mars comes very near at that time; and the nearer the better. Having two good inſtruments perfectly alike, furniſhed with micrometers, and being ſituated at F and G; let them obſerve for ſeveral nights ſucceſſively about midnight, the places of Mars at B and C, as he paſſes by the ſtar A; and take the diſtances A B and A C every night, during his tranſit by this ſtar. Theſe obſervations are to be continued till the diſtances begin to increaſe, and no longer; for then he is paſt the ſtar.

(532.) From theſe obſervations, the neareſt diſtance of Mars from the ſtar A may be found, as obſerved from the places F and G; at leaſt they may be found by interpolation. Let theſe neareſt diſtances be A B and A C; then we have the difference B C, or the angle B S C or F S G. And from the ſituation of the places F and G, the length and poſition of F G will be known; and by theſe, F S may be found. And laſtly, the angle which the radius of the earth ſubtends at the diſtance F S, or the horizontal parallax of Mars will be known. If, inſtead of Mars in oppoſition, VENUS be obſerved on the body of the Sun; then her neareſt diſtances from either limb of the Sun muſt be taken, whoſe difference will give the angle at Venus, ſubtended by F G; the reſt as be[illegible]

Thus the parallax of Venus will be obtained. The parallax of Mars, when nearest the earth, has been found 25″, 27″, and 30″ at different times.

(533.) A STAR or PLANET appears LOWER than it really is, by the QUANTITY of the PARALLAX, which is greater the lower the ſtar is; and therefore the HORIZONTAL PARALLAX is the greateſt. The parallaxes of two planets are as the cofines of the apparent altitudes directly, and their diſtances from the earth's centre reciprocally. For when the diſtance is given, the parallax is as the ſine of the zenith diſtance (by method 1.) and if the apparent altitude be given, the parallax is reciprocally as the diſtance, by method 2, and therefore is in a compound ratio, when neither is given. Here the parallax being very ſmall, one may take the parallax itſelf for the ſine of the parallax.

(534.) The PARALLAX of a PLANET being known, its DISTANCE may be found. For this is only working backward, ſaying, As ſine of the parallax, to the earth's radius; ſo S. zenith diſtance to the planet's diſtance.

(535.) Having the parallax of ANY of the planets, the diſtances of ALL the planets from the ſun may be known, in diameters of the earth, or any ſort of meaſure. For the diſtances of the planets from the ſun and from one another are known in ſome aſſumed meaſure; and by the parallax of a planet, the true diſtance of the earth from it is known: and therefore all the other diſtances will be known by proportion.

(536.) The 7th of theſe methods has been practiſed in determining the parallax of Venus, from obſervations made at different parts of the earth, upon what is called her TRANSIT over the ſun's diſk, a phænomenon, that rarely happens: but when it does happen, it affords the beſt; and indeed the only accurate method of determining that moſt important problem in aſtronomy, THE SUN'S PARALLAX, or the angle under which the earth's ſemidiameter appears from the ſun.

(537.) The firſt tranſit, or paſſage of Venus over the ſun's diſk, that ever was obſerved, happened in 1639, but perhaps the only mortals who ſaw it were Mr HORROX and his friend Mr CRABTREE. Two tranſits have happened ſince; the firſt in 1761, and the laſt in 1769. There will be no more before 1874, and the next to that will happen in 1996. The two laſt tranſits were carefully obſerved. From the firſt of theſe Mr SHORT has computed the ſun's parallax to be 8″.69; and from the laſt, the beſt aſtronomers have concluded it to be 8″.6. This is an obſervation of the greateſt conſequence, becauſe it is only by a knowledge of the ſun's diſtance from the earth, in ſome known meaſure, that we can acquire a knowledge of the true dimenſions of the ſolar ſyſtem.

(538.) As to the FIXED STARS, no method of aſcertaining their diſtance has hitherto been found out. Thoſe who have formed conjectures concerning them, have thought that they were at leaſt 400,000 times farther from us, than we are from the ſun.

(539.) Dr HERSCHEL has propoſed a method of aſcertaining the PARALLAX of the fixed ſtars, ſomething ſimilar, but more complete, than that mentioned by GALILEO and others; for it is by the parallax of the fixed ſtars that we ſhou beſt able to determine their diſtance. Th thod pointed out by Galileo, and firſt atte by Hooke, Flamſtead, Molineux, and Brad taking the diſtances of ſtars from the zenit paſs very near it, has given us a much juſter i the immenſe diſtance of the ſtars, and furn us with an approximation to the knowled their parallax, that is much nearer the truth we ever had before.

(540.) But Herſchel mentions the inſuffic of their inſtruments, which were ſimilar t preſent zenith ſectors, the method of zeni tances being liable to conſiderable errors c count of refraction, the change of poſition earth's axis ariſing from nutation, preceſſion equinoxes, and other cauſes, and the aber of light. The method of his own is by m double ſtars; which is exempted from thei and of ſuch a nature that the annual p even if it ſhould not exceed the tenth pa ſecond, may ſtill become more viſible, and certained, at leaſt to a much greater degre proximation than it has ever been done.

(541.) This method is capable of eve provement which the teleſcope and mecha micrometers can furniſh; but as it goes u ſumptions which can hardly lead to any fu viction, we are not likely to gain any k knowledge, than that the ſtars are at to diſtance to be ſubjected as yet to our calcul He ſuppoſes that the ſtars are, one with a about the ſize of the ſun; and that the di of their apparent magnitudes is owing to apparent diſtances; both of which ſuppo being only hypothetical, it it evident that c cluſions founded on them cannot be depend with abſolute certainty.

SECT. IV. *Of the* DIVISIONS *of the* HEAVENS.

(542.) The STARS, from their apparent ous magnitudes, have been diſtributed in ral claſſes, or orders. Thoſe which appe geſt, are called STARS *of the* FIRST MAGN the next to them in luſtre, STARS *of the* MAGNITUDE; and ſo on to the SIXTH, w the ſmalleſt that are viſible to the bare ey diſtribution having been made long before vention of teleſcopes, the ſtars which ca ſeen without the aſſiſtance of theſe inſtr are diſtinguiſhed by the name of TE STARS.

(543.) The ancients divided the ſtars into particular CONSTELLATIONS, or co ſtars, according as they lay near one ano as to occupy thoſe ſpaces, which the f different ſorts of animals or things wer up, if they were there delineated. A ſtars, which could not be brought into a cular conſtellation, were called *unformed*.

(544.) By this diviſion, the ſtars are guiſhed from one another, that any part may be readily found in the heavens, of a celeſtial globe; on which the con are ſo delineated, that the moſt remark are placed in ſuch parts of the figure

oft eaſily diſtinguiſhed. See *Plates* XXX. and XXI. *fig.* 1. of each.

(545.) The number of the ancient conſtellations 48, and upon our preſent globes about 70. On nex's globes are inſerted Bayer's letters; the ſt in the Greek alphabet being put to the big- ſt ſtar in each conſtellation, the ſecond to the xt, and ſo on; by which means every ſtar is as ſily found as if a name were given to it. Thus, the ſtar γ in the conſtellation of the ram be entioned, every aſtronomer knows as well what ır is meant, as if it were pointed out to him the heavens.

(546.) The ſtarry heavens are alſo divided into three parts: viz. I. The ZODIAC, which extends quite round the heavens; is about 16 degrees broad, ſo that it takes in the orbits of all the planets, as well as that of the moon; and along the middle of which is the *ecliptic*. II. All that region of the heavens which is on the NORTH ſide of the zodiac, containing 21 conſtellations: And, III. That on the SOUTH ſide, contsining 15.

(547.) The following TABLES exhibit the names of the ancient and modern conſtellations, and the number of ſtars obſerved in each of them by different aſtronomers.

(548.) TABLE I. THE ANCIENT CONSTELLATIONS.

NAMES.	ENGLISH NAMES.	NUMBER *of* STARS *in* EACH, *according to* PTOLEMY.	T. BRAHE.	HEVELIUS.	FLAMST.
rſa minor	The Little Bear	8	7	12	24
rſa major	The Great Bear	35	29	73	87
raco	The Dragon	31	32	40	80
:pheus	Cepheus	13	4	51	35
ɔotes, or Arctophilax		23	18	54	54
ɔrona Borealis	The Northern Crown	8	8	8	21
ercules, or Engonaſin	Hercules kneeling	29	28	45	113
yra	The Harp	10	11	17	21
ygnus, or Gallina	The Swan	10	18	47	81
ıſſiopeia,	The Lady in her Chair	13	26	37	55
erſeus	Perſeus	29	29	46	59
uriga	The Waggoner	14	9	40	66
rpentarius, or Opiuchus	Serpentarius	29	15	40	74
rpens	The Serpent	18	13	22	64
gitta	The Arrow	5	5	5	18
quila, or Vultur	The Eagle	15	12	23	71
ıtinous	Antinous		3	19	
elphinus	The Dolphin	10	10	14	18
quulus, or Equi ſectio	The Horſe's Head	4	4	6	10
gaſus, or Equus	The Flying Horſe	20	19	38	89
ıdromeda	Andromeda	23	23	47	66
riangulum	The Triangle	4	4	12	16
ries	The Ram	18	21	27	66
aurus	The Bull	44	43	51	141
emini	The Twins	25	25	38	85
ncer	The Crab	23	15	29	83
o	The Lion	35	30	49	95
ma Berenices	Berenice's Hair		14	21	43
rgo	The Virgin	32	33	50	110
bra, or Chelæ	The Scales	17	10	20	51
orpius	The Scorpion	24	10	20	44
gittarius	The Archer	31	14	22	69
pricornus	The Goat	28	28	29	51
quarius	The Water-bearer	45	41	47	108
ces	The Fiſhes	38	36	39	113
tus	The Whale	22	21	45	97
ion	Orion	38	42	62	78
idanus, or Fluvius	Eridanus, or the River	34	10	27	84
pus	The Hare	12	13	16	19
nis major	The Great Dog	29	13	21	31
nis minor	The Little Dog	2	2	13	14
go Navis	The Ship	45	3	4	64
dra	The Hydra	27	19	31	60
ater	The Cup	7	3	10	31
rvus	The Crow	7	4		9
ntaurus	The Centaur	37			35
pus	The Wolf	19			24
a	The Altar	7			9
rona Auſtralis	The Southern Crown	13			12
ıcis Auſtralis	The Southern Fiſh	18			24

(549.) TABLE II. *The* NEW SOUTHERN CONSTELLATIONS.

Columba Noachi,	Noah's Dove	10	Apis, or Musca,		The Bee or Fly
Robur Carolinum,	The Royal Oak	12	Chamæleon,	——	The Chameleon
Grus ——	The Crane	13	Triangulum Australis,		The South Triangle
Phœnix, ——	The Phœnix	13	Piscis volans, or Passer,		The Flying Fish
Indus, ——	The Indian	12	Dorado, or Xiphias,		The Sword Fish
Pavo, ——	The Peacock	14	Toucan,	——	The American Goose
Apus, or Avis Indica,	The Bird of Paradise	11	Hydrus,	——	The Water Snake

(550.) TABLE III. HEVELIUS'S CONSTELLATIONS *made out of the* UNFORMED STARS.

			HEVELIUS.	FLAMSTEAD.
Lynx —— ——	The Lynx ——		19	44
Leo minor, ——	The Little Lion ——			53
Asterion and Chara ——	The Greyhounds ——		23	25
Cerberus —— ——	Cerberus ——		4	
Vulpecula and Anser ——	The Fox and Goose, ——		27	35
Scutum Sobieski, ——	Sobieski's Shield ——		7	
Lacerta —— ——	The Lizard ——		10	16
Camelopardalus ——	The Camelopard ——		32	58
Monoceros —— ——	The Unicorn ——	——	19	32
Sextans —— ——	The Sextant ——		11	41

SECT. V. *Of* CALCULATING *the* PERIODICAL TIMES, PLACES, &c. *of the* CELESTIAL BODIES; CONSTRUCTING ASTRONOMICAL TABLES, *and* DELINEATING *the* PHASES *of the* MOON.

(551.) This section, if treated fully, would comprehend almost the whole of what may be called PRACTICAL ASTRONOMY. But as it is by far the most difficult and abstruse, so the thorough investigation of it would necessarily lead us into very deep geometrical demonstrations. The great labours of former astronomers have left little, indeed, to do in this respect. Tables of the motions of all the celestial bodies have been made long ago, the periodical times, excentricities, &c. of the planets determined; and, as we suppose, few will desire to repeat these laborious operations, we shall here only give some general hints of the methods by which they have been originally accomplished, that the operations of the young astronomer, who makes use of tables already formed, may not be merely mechanical.

(552.) It has been already observed, that the foundation of all astronomical operations is the drawing a meridian line. This being done, the next thing is, to find out the latitude of the place where the observations are to be made, and for which the meridian line is drawn. Now, the latitude of a place is equal to the elevation either of the north or south pole above the horizon; but as there is no star exactly in either of the celestial poles, to find the altitude of that invisible point, called the POLE *of the heavens*, we must choose some star near it, which does not set; and, having found its greatest and least altitudes, divide their difference by 2; and half that difference, added to the least, or subtracted from the greatest, altitude of the star, gives the exact altitude of the pole, or latitude of the place. Thus, if the greatest altitude of the star observed is 50° and its least 50°, we then know, that the lat. of the place, where the observation was made, is exactly 55°.

(553.) Having found the latitude, the OBLIQUITY *of the* ECLIPTIC, or the angle made by the sun's annual path, with the earth's equator, is easily obtained by the following method. Observe, about the summer solstice, the sun's meridian distance from the zenith, which may be done by a quadrant, with a moveable index furnished with sights; if this distance is subtracted from the latitude of the place, provided the sun is nearer the equator than the place of observation, the remainder will be the obliquity of the ecliptic: but, if the place of observation is nearer the equator than the sun at that time, the zenith distance must be added. By this method the obliquity of the ecliptic hath been determined to be 23° 29′.

(554.) Here it is proper to observe, that the obliquity of the ecliptic to the equinoctial, found, at present, to be above the third part of a degree less than Ptolemy found it. And most of the observers after him, found it to decrease gradually, down to Tycho Brahe's time. If it be objected, that we cannot depend on the observations of the ancients, because of the imperfection of their instruments, we have to answer, that both Brahe and Flamstead are allowed to have been very good observers; and yet we find, that Flamstead makes this obliquity 24 minutes of a degree less than Brahe did, about 100 years before him; and as Ptolemy was 1324 years before Tycho Brahe, so the gradual decrease answers nearly to the difference of time between these three astronomers. If we consider, that the earth is not perfect

fect ſphere, but an oblate ſpheroid, having its s ſhorter than its equatorial diameter; and that ſun and moon are conſtantly acting obliquely, on the greater quantity of matter, about the iator, pulling it, as it were, towards a nearer l nearer coincidence with the ecliptic; it will appear improbable, that theſe actions ſhould dually diminiſh the angle between theſe planes. r is it leſs probable, that the mutual attrac- ns of all the planets ſhould have a tendency bring their orbits to a coincidence: but this nge is too ſmall to become obſervable in many rs.

(555.) The DECLINATION of the SUN from the iator, for any day, may be found, by the ſame thod by which we find the obliquity of the e- ptic: and thus, a table of his declination for eve- day in the year, might be conſtructed: Thus, o, the declination of the ſtars might be found. ving found the declination of the ſun, his ht aſcenſion, and place in the ecliptic, may be ometrically found, by the ſolution of a caſe, in herical trigonometry. For let EQ, in Plate XIX. fig. 8. repreſent the celeſtial equator, ♈ the n, and ♈ X the ecliptic; then, in the right ang- d ſpherical triangle EC♈, we have the ſide E♈, ual to the ſun's declination: the angle EC♈ is ways 23° 29′, being the angle of the ecliptic ith the equator; and angle ♈EC is 90°, or a ght angle. From theſe data, we can find the de EC, the right aſcenſion; and C♈, the ſun's lace in the ecliptic, or his diſtance from the e- uinoctial point; and thus, a table of the ſun's lace, for every day in the year, anſwerable to is declination, may be formed.

(556.) The RIGHT ASCENSION of the STARS ay be found by the ſun's place in the ecliptic, nd a good pendulum clock: for which purpoſe, he motion of the clock muſt be ſo adjuſted, that he hand may run through the 24 hours, in the ime that a ſtar, leaving the meridian, will arrive t it again; which time is ſomewhat ſhorter than he natural day, becauſe of the ſpace the ſun noves through in the mean time eaſtward. The lock being thus adjuſted, when the ſun is in the meridian, fix the hand to the point, from whence we are to begin to reckon our time; and then obſerve when the ſtar comes to the meridian, and mark the hour and minute that the hand then ſhews: The hours and minutes deſcribed by the index, turned into degrees and minutes of the e- quator, will give the difference between the right aſcenſion of the ſun and ſtars; which difference, being added to the right aſcenſion of the ſun, will give the right aſcenſion of the ſtar.

(557.) If we know the right aſcenſion of any ONE ſtar, we may from it, find the right aſcen- ſion of ALL the others which we ſee, by mark- ing the time upon the clock, between the arrival of a ſtar, whoſe right aſcenſion we know to the meridian, and another ſtar, whoſe aſcenſion is to be found. This time, converted into hours and minutes of the equator, will give the difference of right aſcenſions; from whence, by addition, we collect the right aſcenſion of the ſtar which was to be found out.

(558.) When the right aſcenſion and declina- tion of a ſtar is found, its longitude and latitude, or diſtance from the firſt ſtar of Aries, and north or ſouth from the ecliptic, may thence be eaſily found; and the places of the fixed ſtars being all marked in a catalogue, according to their longi- tudes and latitudes, it may be thence conceived, how the longitude and latitude of a planet or co- met may be found for any particular time, by comparing its diſtance from them, and its appar- ent path may thus be traced; and thus, the paths of Mercury and Venus were traced by M. Caſſini.

(559.) To find out the PERIODICAL TIMES of the PLANETS, we muſt obſerve when they have no latitude. At that time the planet is in the e- cliptic, and conſequently, in one of its nodes; ſo that, by waiting till it returns to the ſame node again, and keeping an exact account of the time, the periodical time of its revolution round the ſun, may be known pretty exactly. By ſimilar obſervations, from the theory of the earth's mo- tion, we can find the poſition of the line of the nodes; and when once the poſition of this line is found, the angle of inclination of the planet's or- bit to the earth may alſo be known.

(560.) The EXCENTRICITY of the EARTH'S ORBIT may be determined, by obſerving the ap- parent diameters of the ſun at different times: when the ſun's diameter is leaſt, the earth is at the greateſt diſtance; and, when this diameter is greateſt, the earth is at its leaſt diſtance from him. But, as this method muſt neceſſarily be precari- ous, another is recommended by Keil, by obſer- ving the velocity of the earth in its orbit, or the apparent velocity of the ſun, which is demonſtra- ted to be always reciprocally as the ſquare of the diſtance.

(561.) The excentricities of the orbits of the other planets may be likewiſe found, by obſerving their velocities at different times; for all of them obſerve the ſame proportions, with regard to the increaſe or decreaſe of their velocity, that the earth does; only, in this caſe, care muſt be taken, to obſerve the *real*, not the *apparent*, velocities of the planets, the laſt depending on the motion of the earth at the ſame time. Their aphelia, or points of their orbits, where they are fartheſt from the ſun, may be known, by making ſeveral obſervations of their diſtances from him, and thus perceiving, when theſe diſtances ceaſe to increaſe.

(562.) The poſition of the aphelion being de- termined, the planet's diſtance from it, at any time, may alſo be found by obſervation, which is called its *true* or *coequated* anomaly; but, by ſuppoſing the motion of the planet to be regular and uniform, tables of that motion may eaſily be conſtructed. From thence, the planet's mean place in its orbit, may be found for any moment of time; and one of theſe moments being fixed upon, as an epocha or beginning of the table, it is eaſy to underſtand, that from thence, tables of the planet's place in its orbit, for any number of years, either preceding, or ſubſequent to that period, may be conſtructed.

(563.) ASTRONOMICAL TABLES are to be con- ſtructed, according to the meridian of equal time, and not true or apparent time, becauſe of the in- equalities of the earth's motion, as well as that of the planet, and equations muſt be made, to be added to, or ſubtracted from the mean motion

of the planet, as occaſion requires; which will be readily underſtood from what we have already mentioned, concerning the unequal motion of the earth in its orbit. When all the neceſſary tables are conſtructed by this or ſimilar methods, the calculating of the planetary places becomes a mere mechanical operation, and conſiſts only in the additions and ſubtractions, according to the directions given along with ſuch tables. But it muſt be obſerved that the accidental interference of the planets with one another, by their mutual attractions, renders it impoſſible to conſtruct any tables, that ſhall remain equally perfect: and therefore, frequent actual obſervations and corrections of the tables will be neceſſary. This diſturbance, however, is inconſiderable, except in Jupiter and Saturn, and they are in conjunction only at a diſtant period.

(564.) The above rules, with regard to the planets, are alſo applicable to the moon; but with more difficulty, on account of the great inequalities of her motions. From theſe irregularities, it may be well concluded, that the calculation of the moon's place in her orbit, is a very difficult matter; and indeed, before NEWTON, aſtronomers in vain laboured to ſubject the lunar irregularities to any rule. By his labours, however, and thoſe of other aſtronomers, theſe difficulties are in a great meaſure overcome; and calculations, with regard to this luminary, may be made, with as great certainty, as concerning any other. Her periodical time may be determined from the obſervation of two lunar eclipſes, at as great a diſtance from one another as poſſible: for, in the middle of every lunar eclipſe, the moon is exactly in oppoſition to the ſun.

(565.) Compute the time between theſe two eclipſes or oppoſitions, and divide this by the number of lunations that have intervened, and the quotient will be the ſynodical month, or time the moon takes to paſs from one conjunction to another, or from one oppoſition to another. Compute the ſun's mean motion in the time of the ſynodical month, and add this to the entire circle deſcribed by the moon. Then, as that ſun is to 360°, ſo is the quantity of the ſynodical month to the periodical, or time that the moon takes to move from one point of her orbit to the ſame point again.

(566.) Thus COPERNICUS in the year 1500, November 6th, at 2 hours 20 minutes, obſerved an eclipſe of the moon at Rome; and Auguſt 1ſt, 1525, at 4 hours 25 minutes, another at Cracow: hence the quantity of the ſynodical month is thus determined:

	Y.	D.	H.	M.
Obſerv. 2d	1523	237	4	25
Obſerv. 1ſt	1500	319	2	20
Interval of time	22	292	2	5
Add the intercalary days for leap years.		5		
Exact interval	22	297	2	5, or 11,991,005′

This interval divided by 282, the number of months elapſed in that time, gives 29 days 12 hours 41 minutes for the length of the ſynodical month. But from the obſervations of two other eclipſes, the ſame author more accurately determined the quantity of the ſynodical month to be 29 degrees 12 hours 45 minutes 3 ſeconds; from whence the mean periodical time of the moon comes to 27 days 7 hours 43 minutes 5 ſeconds, which exactly agrees with the obſervations of later aſtronomers.

(567.) When the quantity of the periodical month is found, we may find the moon's diurnal and horary motion; and thus may tables of the moon's mean motion be conſtructed: and if from the moon's mean diurnal motion that of the ſun be ſubtracted, the remainder will be the moon's mean diurnal motion from the ſun.

(568.) Having found the moon's diſtance from the ſun, her phaſis for that time may be eaſily delineated by the following method laid down by Keil: Let the circle COBP, PLATE XXVIII, fig. 3, and 4. repreſent the diſk of the moon, which is turned towards the earth; and let OP be cut by the diameter BC at right angles; and making LP the radius, take LF equal to the coſine of the elongation of the moon from the ſun: and then upon BC, as the great axis, and LF the leſſer axis, deſcribe the ſemi-ellipſe BFC. This ellipſe will cut off from the diſk of the moon the portion BFCP of the illuminated face, which is viſible to us from the earth.

(569.) As the moon in the middle of a total eclipſe, is exactly in the node, if the ſun's place be found for that time, and ſix ſigns added to it, the ſun will give the place of that node, provided the eclipſe be lunar; but if ſolar, the place of the node and of the ſun are the ſame. From comparing two eclipſes together, the mean motion of the nodes will thus be found. The apogee of the moon may be known from her apparent diameter, and by comparing her place when in the apogee at different times, the motion of the apogee itſelf may alſo be determined.

SECT. VI. PRELIMINARY OBSERVATIONS reſpecting ECLIPSES.

(570.) Before we lay down rules for calculating eclipſes, it is neceſſary to make a few general obſervations reſpecting their nature and cauſes. All the planets and ſatellites being illuminated by the ſun, caſt their ſhadow towards that point of the heavens which is oppoſite to the ſun. This ſhadow is nothing but a privation of light, in the ſpace hid from the ſun by the opaque body that intercepts his rays. When the ſun's light is intercepted by the moon, ſo that he appears covered in whole, or in part, to any part of the earth, he is ſaid to *undergo an* ECLIPSE; though, properly ſpeaking, it is only an eclipſe of that part of the earth where the moon's ſhadow or penumbra falls. When the earth comes between the ſun and moon, the moon falls into the earth's ſhadow; and having no light of her own, ſhe ſuffers a real and total eclipſe from the interception of the ſun's rays. When the ſun is eclipſed to the moon's inhabitants, on the ſide next the earth, ſee her ſhadow like a dark ſpot travelling over the earth, about twice as faſt as its equator

Fig. 1.

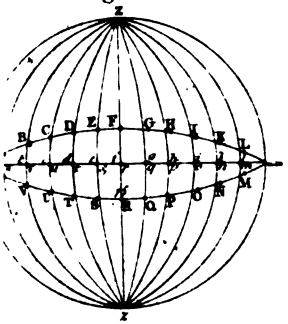


Fig. 2.

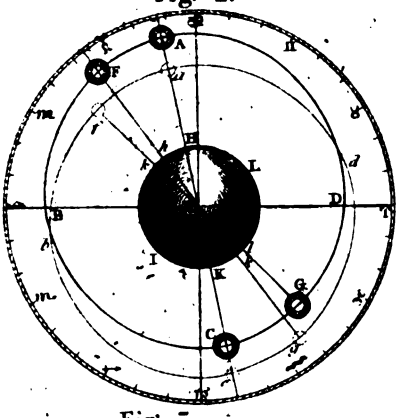


Fig. 3.

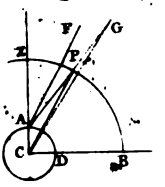


Fig. 4.

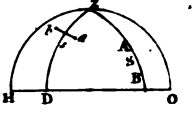


Fig. 5.

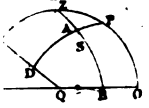


Fig. 7.

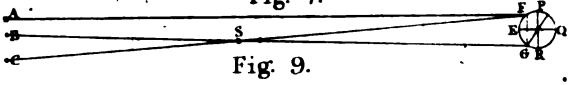


Fig. 8.

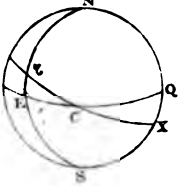


Fig. 9.

Fig. 6.

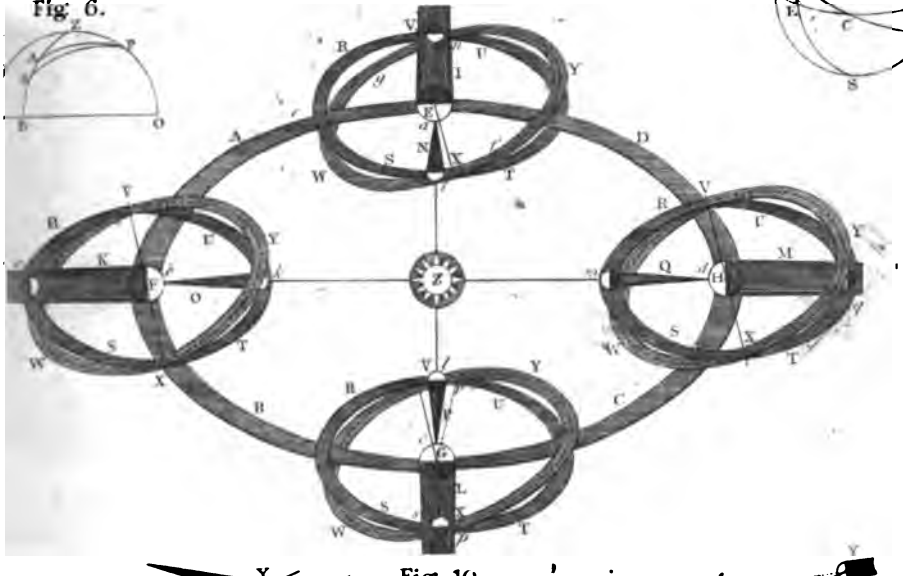


Fig. 10.

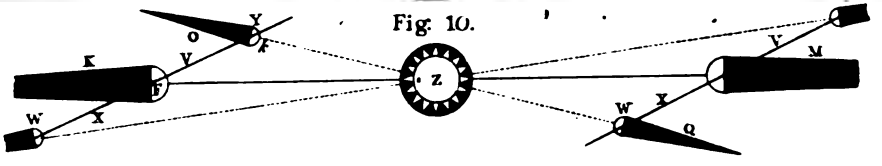


Fig. 11.

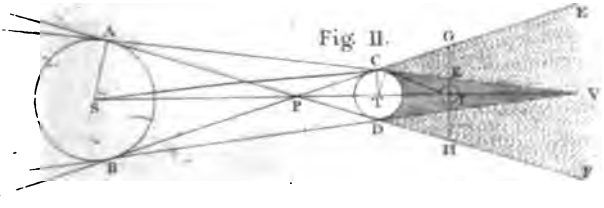


Fig. 13.

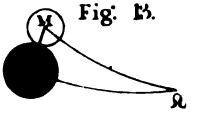


Fig. 12.

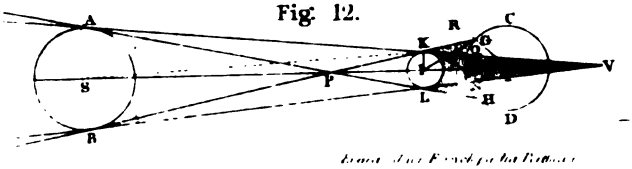
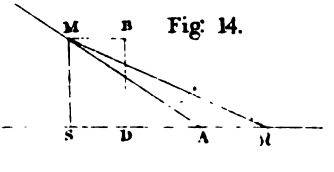


Fig. 14.



parts move, and the ſame way as they move. en the moon is in an eclipſe, the ſun appears ɔſed to her inhabitants; totally to all thoſe s on which the earth's ſhadow falls, and of as ; continuance as they are in the ſhadow.

71.) Although all opaque bodies, on which ſun ſhines, have their ſhadows, yet ſuch are diſtances of the planets, and the ſize of the that the primary planets can never eclipſe another. A primary can eclipſe only its ſe- dary, or be eclipſed by it; and never but n in oppoſition or conjunction with the ſun. primary planets are very ſeldom in theſe po- ns, but the ſun and moon are ſo every month; nce one may imagine, that theſe two lumina- ſhould be eclipſed every month. But there few eclipſes in reſpect of the number of new full moons; the reaſon of which we ſhall now lain.

72.) If the moon's orbit were coincident with plane of the ecliptic, in which the earth al- s moves and the ſun appears to move, the n's ſhadow would fall upon the earth at eve- hange, and eclipſe the ſun to ſome parts of earth. In like manner, the moon would go ugh the middle of the earth's ſhadow, and be ɔſed at every full: but with this difference ſhe would be totally darkened for above an r and an half; whereas the ſun never was a- e four minutes totally eclipſed to us by the in- oſition of the moon. But one half of the n's orbit is elevated 5½ degrees above the e- tic, and the other half as much depreſſed be- it; and when the ſun and moon are more 1 17 degrees from either of the nodes at the of conjunction, the moon is then generally high or too low in her orbit to caſt any part er ſhadow upon the earth: when the ſun is e than 12° from either of the nodes at the of full moon, the moon is generally too high oo low in her orbit to go through any part of earth's ſhadow: and in both theſe caſes there be no eclipſe.

573.) But when the moon is leſs than 17° from er node at the time of conjunction, her ſha- or penumbra falls more or leſs upon the h, as ſhe is more or leſs within this limit. And n ſhe is leſs than 12° from either node at the of oppoſition, ſhe goes through a greater or portion of the earths ſhadow, as ſhe is more eſs within this limit. Her orbit contains °; of which, 17°, the limit of ſolar eclipſes on er ſide of the nodes, and 12°, the limit of lu- eclipſes, are but ſmall portions; and as the commonly paſſes by the nodes but twice in a , it is no wonder that we have ſo many new full moons without eclipſes.

574.) To illuſtrate this let ABCD, PLATE IX, fig. 9. be the ecliptic, RSTU, a circle ly- in the ſame plane with the ecliptic, and VXYW moon's orbit, all thrown into an oblique view, ch gives them an elliptical ſhape to the eye, half of the moon's orbit, as, VWX, is al- s below the ecliptic, and the other half XYV ve it. The points V and X, where the moon's it interſects the circle RSTU, which lies even h the ecliptic, are the moon's nodes; and a t line XEV, drawn from one to the other, through the earths centre, is the line of the nodes which is carried almoſt parallel to itſelf round the ſun in a year. If the moon moved round the earth in the orbit RSTU, which is coincident with the plane of the ecliptic, her ſhadow would fall upon the earth every time ſhe is in conjunction with the ſun, and at every oppoſition ſhe would go through the earth's ſhadow; and thus the ſun would be eclipſed at every change, and the moon at every full.

(575.) But although the moon's ſhadow N muſt fall upon the earth at *a* when the earth is at E, and the moon in conjunction with the ſun at *i*, becauſe ſhe is then very near one of her nodes; and at her oppoſition *n* ſhe muſt go through the earth's ſhadow I, becauſe ſhe is then near the other node yet, in the time that ſhe goes round the earth to her next change, according to the order of XYVW, the earth advances from E to *e*, according to the order of EFGH; and the line of the nodes VEX, being carried nearly parallel to itſelf, brings the point *f* of the moon's orbit in conjunction with the ſun at that next change. The moon being then at *f*, is too high above the ecliptic to caſt her ſhadow on the earth; and as the earth is ſtill moving forward, the moon at her next oppoſition will be at *g*, too far below the ecliptic to go through any part of the earth's ſhadow; for by that time the point *g* will be at a conſiderable diſtance from the earth as ſeen from the ſun.

(575.) When the earth comes to F, the moon in conjunction with the ſun Z is not at *k* in a plane coincident with the ecliptic, but above it at Y in the higheſt part of her orbit; and then the point *b* of her ſhadow O goes far above the earth as in *fig.* 10, which gives an edge view of *fig.* 9. The moon, at her next oppoſition, is not at *o*, but at W, where the earth's ſhadow goes far above her, as in *fig.* 10. In both theſe caſes, the line of the nodes is about 90° from the ſun, and both luminaries are as far as poſſible from the limits of the eclipſes. When the earth has gone half round the ecliptic, from E to G, the line of the nodes VGX is nearly, if not exactly, directed towards the ſun at Z; and then the new moon *l*, caſts her ſhadow P on the earth G: and the full moon *p* goes through the earth's ſhadow L; which brings on eclipſes again, as when the earth was at E. When the earth comes to H, the new moon falls not at *m* in a plane coincident with the ecliptic CD, but at W in her orbit below it; and then her ſhadow Q (ſee *fig.* 10.) goes far below the earth. At the next full ſhe is not at *q* (*fig.* 9.) but at Y in her orbit 5½ degrees above *q*, and at her greateſt height above the ecliptic CD; being then as far as poſſible, at any oppoſition, from the earth's ſhadow M, as in *fig.* 10.

(577.) Thus when the earth is at F and G, the moon is about her nodes at new and full, and in her greateſt north and ſouth declination (or latitude as it is generally called) from the ecliptic at her quarters; but when the earth is at F or H, the moon is in her greateſt north and ſouth declination from the ecliptic at new and full, and in the nodes about her quarters. The point X, where the moon's orbit croſſes the ecliptic, is called the ASCENDING NODE, becauſe the moon aſcends from it above the ecliptic; and the oppoſite

site point of interſection V is called the DESCENDING NODE, becauſe the moon deſcends from it below the ecliptic.

(578.) When the moon is at Y in the higheſt point of her orbit, ſhe is in her greateſt north latitude; and when ſhe is at W in the loweſt point of her orbit, ſhe is in her greateſt ſouth latitude. If the line of the nodes, like the earth's axis, was carried parallel to itſelf round the ſun, there would be juſt half a year between the conjunctions of the ſun and nodes. But the nodes ſhift backwards, or contrary to the earth's annual motion, $19\frac{1}{2}$ deg. every year; and therefore the ſame node comes round the ſun 19 days ſooner every year than on the year before. Conſequently, from the time that the aſcending node X (when the earth is at E) paſſes by the ſun as ſeen from the earth, it is only 173 days (not half a year) till the deſcending node V paſſes by him.

(579.) Therefore in whatever, time of the year we have eclipſes of the luminaries about either node, we may be ſure that in 173 days afterward we ſhall have eclipſes about the other node. And when at any time of the year the line of the nodes is in the ſituation VGX, at the ſame time next year it will be in the ſituation *rGs*; the aſcending node having gone backward, that is, contrary to the order of ſigns, from X to *s*, and the deſcending node from V to *r*; each $19\frac{1}{2}$ deg.

(580.) At this rate, the nodes ſhift through all the ſigns and degrees of the ecliptic in 18 years and 225 days; in which time there would always be a regular period of eclipſes, if any complete number of lunations were finiſhed without a fraction. But this never happens: for if both the ſun and moon ſhould ſtart from a line of conjunction with either of the nodes in any point of the ecliptic, the ſun would perform 18 annual revolutions and 222 degrees over and above, and the moon 230 lunations and 85 degrees of the 231ſt by the time the node came round to the ſame point of the ecliptic again; ſo that the ſun would then be 138 degrees from the node, and the moon 85 degrees from the ſun. But in 223 mean lunations, after the ſun, moon, and nodes, have been once in a line of conjunction, they return ſo nearly to the ſame ſtate again, as that the ſame node, which was in conjunction with ſun and moon at the beginning of the firſt of theſe lunations, will be within 28′ 12″ of a degree of a line of conjunction with the ſun and moon again, when the laſt of theſe lunations is completed. And therefore in that time there will be a regular period of eclipſes, or return of the ſame eclipſe, for many ages.

(581.) In this period, (which was firſt diſcovered by the Chaldeans) there are 18 Julian years 11 days 7 hours 43 minutes 20 ſeconds, when the laſt day of February in leap-years is four times included; but when it is five times included, the period conſiſts of only 18 years 10 days 7 hours 43 minutes 20 ſeconds. Conſequently, if to the mean time of any eclipſe, either of the ſun or moon, you add 18 Julian years 11 days 7 hours 43 minutes 20 ſeconds, when the laſt days in February in leap-years comes in four times, or a day leſs when it comes in five times, you will have the mean time of the return of the ſame eclipſe. But the falling back of the line of conjunctions or oppoſitions of the ſun and moon 28′ 12″ with reſpect to the line of the nodes in every period, will wear it out in proceſs of time; and after that, it will not return again in leſs than 12,492 years.

(582.) Theſe eclipſes of the ſun, which happen about the aſcending node, and begin to come in at the north pole of the earth, will go a little ſoutherly at each return, till they go quite off the earth at the ſouth pole; and thoſe which happen about the deſcending node, and begin to come in at the ſouth pole of the earth, will go a little northerly at each return, till at laſt they quite leave the earth at the north pole.

Sect. VII. *Of* Calculating Eclipſes.

(583.) The chief things to be conſidered, in the calculation of eclipſes, are, the MAGNITUDES of the SHADOW and PENUMBRA of the opaque body, and the ECLIPTICAL LIMITS, or the diſtance from the NODE, when an eclipſe of the ſun or moon will happen. Theſe muſt be calculated both for lunar and ſolar eclipſes. The operations may be performed as follows.

I. *For* Lunar Eclipſes.

(584.) In *Plate* XXIX. *Fig.* 11. Let AB be the ſun, and CD the earth. Draw AC, BD, by the edges of the ſun and earth, which will meet in a point V, becauſe the ſun is bigger than the earth. Through the centres of the ſun and earth S and T, draw STV. Alſo draw BCE, ADF, touching the contrary ſides of the ſun and earth, interſecting in P; alſo draw SC and CT. If the whole figure be turned round, about the axis SV, the lines AV, BV, APF, BPE, will generate the two cones CVD, EPF; the cone CVD, is the dark ſhadow of the earth, EPF continued, is the penumbral cone. And beyond V, the ſection of the cone EPF, will be all in the penumbra.

(585.) Hence, I. *Half the angle* of the *cone of the earth's ſhadow* CVT, is equal to the ſun's apparent ſemidiameter, leſs his horizontal parallax. For in the triangle SCV, the external angle SCA = CVS + CST. And CST is the ſun's parallax. Therefore CVT = SCA − CST.

(586.) II. Half of the angle of the *earth's penumbral cone* CPT, is equal to the ſun's ſemidiameter and his horizontal parallax. For in the triangle CSP, the external angle CPT = PCS + CST.

(587.) III. Hence half the angle of the earth's penumbral cone CPT, is equal to half the angle of the dark cone CVT + twice the ſun's horizontal parallax CST.

(588.) IV. The apparent ſemidiameter of the earth's dark ſhadow IK, upon the moon's orbit, is equal to the ſum of the horizontal parallaxes of the ſun and moon, leſs the ſun's apparent ſemidiameter. For the angle VCI = CIT − CVI = CIT − SCA + CST.

(589.) V. The apparent ſemidiameter of the earth's penumbra, GI, upon the moon's orbit, is equal to the ſum of the horizontal parallaxes of the ſun and moon + the ſun's apparent ſemidiameter. For in the triangle PCI, the external angle ECI = CIT + CPT = CIT + PCS + CST.

(490.) VI. Hence to find the LENGTH of the EARTH'S SHADOW. In the triangle CTV there

5 is

given the angle V = sun's apparent semidiameter — his parallax, and CT the earth's radius, to find TV.

I. *For the* SHADOW *and* PENUMBRA, *in* SOLAR ECLIPSES.

(591.) In Plate XXIX. Fig. 12: Let AB be the sun, KL the moon, CD the earth. Draw the tangents AK, BL, by the edges of the sun and moon, on the same side, to meet in V; and BKG, ALH to touch the contrary sides. Draw SK, IK; and through S and I the centres of the sun and moon, draw the axis SIV. Then if the whole figure AKVLB be turned about the axis SV, the sides AV, BV, and PH, PG, will generate two cones KVL, GPH. The cone KVL is the dark shadow of the moon, and the cone GPH is the moon's penumbral cone. Hence,

(592.) I. The angle of the cone of the moon's shadow KLV, the angle of the penumbral cone KPL, the angles GKV, and HLV, are each equal to the sun's apparent diameter AKB, very nearly, and half the angle of either cone P or V is equal to the sun's apparent semidiameter. For by reason of the great distance of the sun from T, in respect of TP, TV, TI; the apparent diameter of the sun, seen from any of the places V, T, I, P, K, will be the same, that is, the angles AVB or KVL, APB or KPL, AKB or GKV, ALB or HLH are all equal; differing only by the angle KSI, which in the moon is insensible.

(593.) II. The height of the cone IP is equal to the cone VI. And KPL, KVL, are equal and similar. For the angles at P and V are equal; and KL is common.

(594.) III. The apparent semidiameter of the moon's dark shadow QO, upon the earth at O, seen from the moon, is equal to the moon's apparent semidiameter — the sun's apparent semidiameter. And if the sun's apparent semidiameter be greater, the shadow does not reach the earth. For draw KO; then in the triangle KOV, VKO = KOS — KVS = KOI — AVS = KOI — ½, the sun's apparent diameter.

(595.) IV. The apparent semidiameter of the moon's penumbra GO, upon the surface of the earth, as seen from the moon, is equal to the sum of the apparent semidiameters of the sun and moon. Draw GI and TGR. Then in the triangle GPI, the external angle GIO = GPI + PGI = KPI + KGI = KPI + KOI = AKS + KOI.

(596.) V. Hence to find the LENGTH IV of the MOON'S SHADOW. In the triangle KVI, there is given the angle KVI = half the sun's apparent diameter, and KI the earth's radius; whence VI will be had; and to find the arch QN of the earth, involved in the moon's dark shadow. In the triangle QVT, we have given TV the difference between the moon's distance from the earth, and the height of the shadow; and the angle QVO = the sun's apparent diameter, and TQ the radius of the earth; to find the angle TQV, to which add QVT, and the sum is the angle QTO or arch QO; and doubled gives the whole arch QN.

(597.) VI. To find the ARCH of the EARTH GH involved in the PENUMBRA; Say, As the earth's radius GT: to S. of the sun's apparent semidiameter:: so is PT the sum of the moon's distance and cone's height: to S.TGP or RGK. From this take the sun's apparent semidiameter, and there remains GTO = GO, which doubled gives GH. For in the triangle GPT, there is given the angle P = the sun's apparent semidiameter, and PT the moon's distance and height of the cone, and TG the earth's radius; to find the angle RGK = GPT + PTG. Therefore PTG or OTG = RGK — GPT = RGK — the sun's apparent semidiameter.

III. To FIND *the* ECLIPTICAL LIMITS.

(598.) An ECLIPSE of the MOON can only happen, when the distance of the centres of the moon, and of the earth's penumbra, is less than the sum of their semidiameters. For if the distance is greater, the moon and penumbra cannot touch one another.

(599.) An ECLIPSE of the SUN cannot happen, unless the distance of the centres of the sun and moon, be less than the sum of their semidiameters; when seen from a certain place. That it shall appear in no place, the moon's parallax must be added to the sum of the semidiameters.

(600.) In lunar eclipses, therefore, the moon's latitude must be less than the sum of the semidiameters of the moon and of the earth's penumbral shadow, taken at the moon's orbit. And in solar eclipses, the moon's latitude must be less than the sum of the sun's and moon's semidiameters, added to the moon's horizontal parallax; that the eclipse may be visible some way: Or without the parallax, to be visible in a certain place.

(601.) Therefore in the right angled spherical triangle, Plate XXIX, fig. 13, ☊ SM, having the angle ☊, and the distance SM, the distance of the sun from the node ☊ S will be known, or the ecliptic limits. The mode of finding which, may be seen from the following

EXAMPLE.

	′	″
Mean apparent semidiameter of the *Sun*	16	4
Parallax of the Sun		12
Mean apparent semidiameter of the *Moon*	15	38
Parallax of the moon . . .	59	5
Inclination of the moon's orbit .	5	8 30

Hence will be obtained,

The semidiameter of the earth's penumbra	1	13	21
The semidiam. of the moon and earth's shadows		56	51
The semidiam. of the Sun and Moon		31	42
The same with the parallax . .	1	28	47

In the triangle ☊ SM for the eclipse of the moon.

Here SM = 1° 13′ 21″ + 15 38″ = 1° 28′ 59″.

S. ☊ = 5	8½	—	—	8.952398
S.SM = 1	28	59	—	8 413067
Radius	—	—	—	10.
S. ☊ S = 16	47	—	—	9 465669

the limit for the lunar eclipse at a medium.

In the triangle ☊ SM for the eclipse of the Sun.

Here SM = 1° 28′ 47″.

S. ☊,	= 5	8½	— —	8.052398
S. SM	= 1	28 47	—	8.412009
Radius		— —		10.

S. ☊. S. = 16 45 — 9.459611

the limit for the solar eclipse, in any place; about the same as for the lunar. But for a particular place, SM = 31 42; and S ☊ comes out only 5°.54′ for the limit.

(602.) I. Hence there will at least be FOUR ECLIPSES in a YEAR, taking one year with another; two of the MOON, and two of the SUN. For 16° 47′ + 16° 45′ = 33° 32′ or 33½°. Therefore the sun stays above a month within the ecliptic limits twice in the year. During which time the moon makes two revolutions, and therefore must cause two eclipses, either time; one of the moon, and another of the sun.

(603.) HALF of the ECLIPSES will, in general, be INVISIBLE at any given place. And consequently one year with another there can only be TWO VISIBLE ECLIPSES in a year, the one *lunar* and the other *solar*. For the sun and moon spend as much time below the horizon as above it.

(604.) III. The ECLIPTICAL LIMITS may be found for TOTAL ECLIPSES, as well as for PARTIAL ones, by the same method: *i. e.* by taking SM = the difference of the semidiameters of the earth's dark shadow and of the moon, in lunar eclipses; or = the difference of the semidiameters of the moon and sun, in solar eclipses.

(605.) IV. ECLIPSES do not happen always in the SAME PLACES of the zodiac; but in places *more and more westward*. For the eclipses being about the nodes, and the nodes regressive at the rate of 19 degrees in a year; the places of the eclipses are 19 degrees more west every succeeding year.

(606.) From these premises, it will be necessary, in calculating a *particular eclipse*, to consider the ANGLE that the moon's way makes with the sun at the time of an eclipse. See Plate XXIX, fig. 14. Let ☊ S be the ecliptic, ☊ M the moon's orbit, ☊ the node. And let S be the sun, in the solar eclipse; or the centre of the earth's shadow, in the lunar; and M the moon at the time of the syzygy. Take ☊ A to ☊ S as the sun's horary motion, to the moon's, at that time; draw MA, then MAS is the angle required; and AM the moon's apparent orbit.

(607.) For by construction, in the time that the moon has been moving from ☊ to M (that is, through ☊ S reckoned in the ecliptic,) the sun has moved through a space DS equal to ☊ A.—Therefore the sun was in D, when the moon was in the node at ☊. Draw DB, MB parallel to SM, SD; and draw B ☊, which will be parallel to MA. Now since the moon makes the same latitude DB or SM, in the same time, whether the sun moves or stands still. And since SM is her latitude, when the sun is at S, DB (equal to SM) will be her latitude, supposing the sun had stood at D, without any motion towards S; and consequently ☊ B will be her apparent way, to an eye at D, through which she seems to move in the same time. Or, which is the same thing, AM will be her apparent way to an eye fixed at S.—For the triangles AMS and ☊ BD are equal. MAS is the angle of her way with the ecliptic. By the theory of relative motions, in both moving the same way, all the apparent motions are the same, as if one body stood still and the other moved forward, with the difference of their motions. And here ☊ D or AS is the difference of their motions supposing S to be fixed.

(608.) Hence, as the moon's horary motion to the sun's horary motion : : S ☊ the distance from the node to A ☊. Then SA = S ☊ − ☊. As sine of SA : rad : : tangent moon's latitude SM : tangent angle A.

(609.) It is the *apparent orbit* AM that must be made use of, in calculating *all the particulars of an eclipse*. For an observer considers not S as moving; and therefore only the relative motion is concerned. To calculate, therefore, an eclipse of the moon, the following rules will be found

IV. RULES *for* CALCULATING LUNAR ECLIPSES.

(610.) I. Find the true time of the opposition when an eclipse is to happen; and let that be reduced to apparent time.

(611.) II. Find the true places of the sun and moon, when in opposition: 2. The sun's true anomaly, and his place of his apogee: 3. The place of the moon's ascending node, and of her apogee, and her latitude.

(612.) III. Let ☊ S, fig. 2. Plate XXX. be a part of the ecliptic; ☊ M the moon's orbit; C the centre of the earth's shadow, and M the moon when in opposition. Take ☊ A, to ☊ S as S is known by calculation; as the sun's horary motion, to the moon's; which are known from the astronomical tables. Draw AM, for the motion of the moon from the sun. Then in the obliquangled spherical triangle ASM, there is given (= ☊ S — ☊ A); and SM the moon's latitude found by calculation: to find the angle SMA.

(613.) IV. Let fall SP perpendicular to AM. Then since the arches SM, MP, SP, are very small, they may be taken for right lines; and the triangle SMP for a plane triangle. Then by SM and angle SMP; MP and SP will be found. Where P is the place of the moon in the middle of the eclipse. Likewise the time of the moon moving through MP will be known by her horary motion; and from thence the time when she was in P, or the middle of the eclipse.

(614.) V. From the astronomical tables, take the sun and moon's apparent semidiameters, for the time of opposition; and their horizontal parallaxes.

(615.) VI. From any convenient scale of equal parts, with the centre P and radius PB, equal to the minutes contained in the moon's radius, describe the circle BCo for the moon. And with the radius SD (equal to the sum of the sun and moon's horizontal parallaxes — the sun's semidiameter, all in minutes), describe the circle DH from the centre S, then this circle will represent the earth's dark shadow. Likewise with the same centre S, and radius SF (equal to the sum of the sun and moon's parallaxes + the sun's semidiameter, in minutes), describe the circle FQG; and this will be the earth's penumbra.

(616.) VII. These rules being observed, it will

Southern Hemisphere with the Figures of the Conſtellations.

Fig. 2.

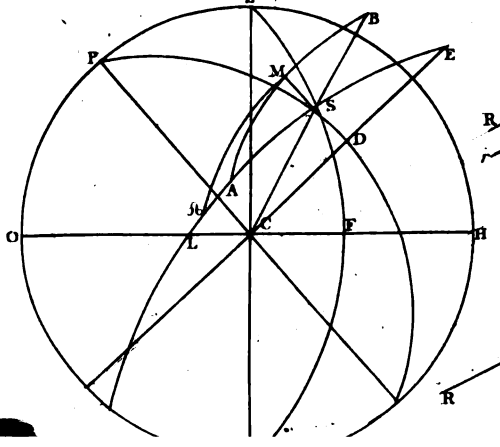


Fig. 3.

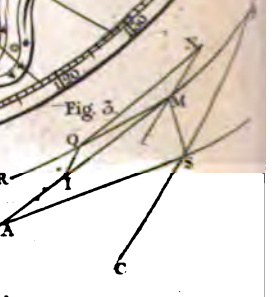


Fig. 4.

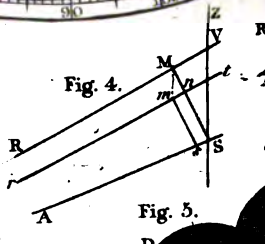
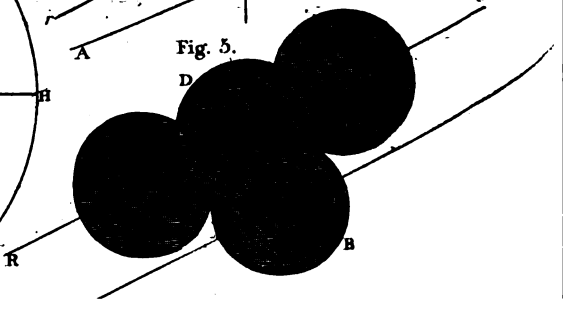
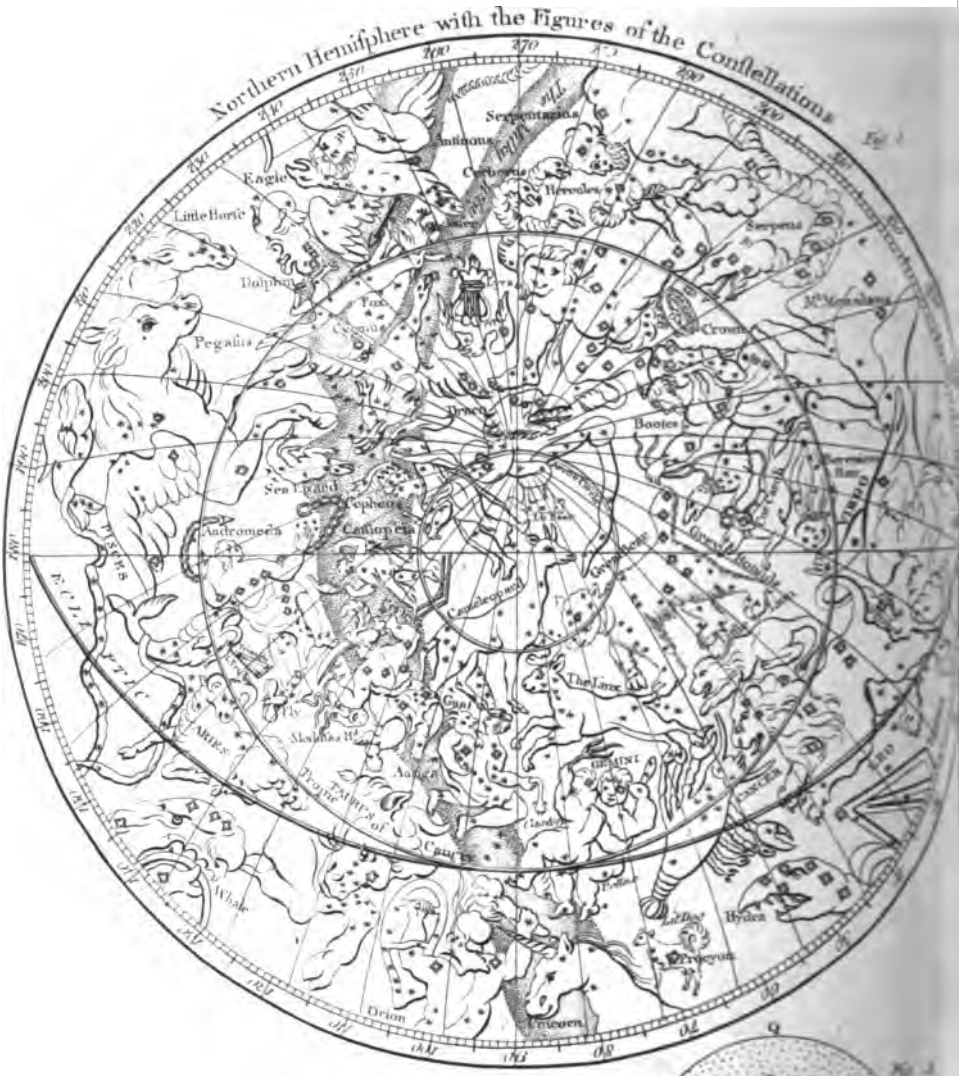
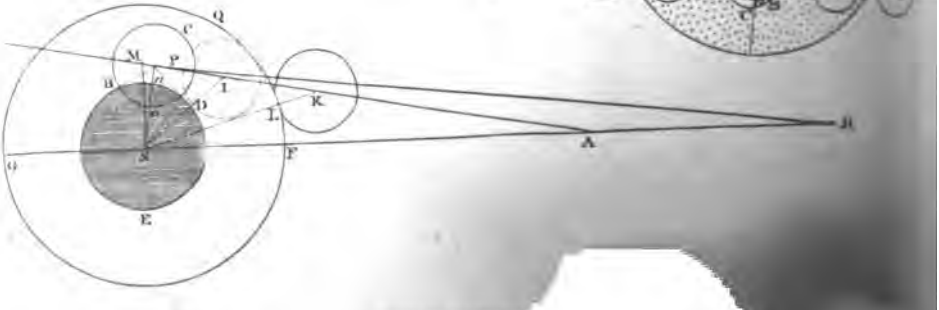


Fig. 5.



Northern Hemisphere with the Figures of the Constellations





e easy to find all the requisites by scale and compasses, by measuring them; or rather by calculation, in the several right-angled plain triangles, contained in the scheme. Thus, to find when the moon first touches the penumbra at L; in the right angled triangle SPK, there is given SP, and K (the sum of the radii SL and PB), to find PK. Which being known, the time of the moon's passing through it will be known, by the moon's horary motion from the sun.

(617.) To find when the moon first enters the dark shadow of the earth in D: In the right angled triangle SPI, there is given SP, and SI, (the sum of the radii SD, PB) to find PI; and consequently the time of half the duration in the shadow.

(618.) To find the digits or 12th parts of the moon eclipsed. Here *no* the part eclipsed is = $Sn+Po-SP$; and $\frac{12no}{2Po}$ or $\frac{6no}{Po}$ is the number of digits eclipsed. In TOTAL ECLIPSES of the moon, the earth's shadow often reaches farther than the moon. And then more than 12 digits are said to be eclipsed, supposing the moon's disk to be produced so far.

(619.) To find the time when the moon wholly enters into the dark shadow BED, follow the same method as when it entered into the penumbra GQF. This will be evident, by supposing GQL the dark shadow. In that case SI will be the difference of the semidiameters of the moon and dark shadow. The times of passing through PI, PK, &c. being known, and the time of the middle of the eclipse at P; the *beginning* and *ending* will be known.

(620.) VIII. Hence, if the moon or circle CBo never touches the circle GQF, there will be no eclipse, not even by the penumbra. And if the same circle never touches the circle BDE, there will be no part of the moon totally eclipsed. And if the whole circle CBo enter into the circle BED, the whole moon will be totally eclipsed; and that is when SP is less than the difference of the semidiameters SD and PB. If the point S be in the node, then P falls upon S, and the eclipse is central. When only a part of the circle CBo goes into the circle BED, the eclipse is a partial one, as in this figure.

(621.) IX. The time of the eclipse being known for any particular place, it is easy to know if it be visible at that place, by knowing if the moon be risen. Or the place will be known where the moon is vertical; and therefore it will be visible to all places, within a quadrant's distance from it.

(622.) X. If the spectator live in the place, (or in the same longitude) which the tables are calculated for; he will see the eclipse at the time determined by the calculation. If not, he will see it an hour sooner for every 15° difference of longitude, that he lives west from it. And so much later, if he lives eastward; that is, in the way of reckoning time. But in regard to absolute time, it is seen from all places at the same instant.

(623.) EXAMPLE. *To* FIND *the* TIME *of the* LUNAR ECLIPSE, *December* 13, 1769; *its* DURATION [illegible] DIGITS ECLIPSED.

[illegible] time of the syzygies, by the tables, is found to be Dec. 12*d*. 19*h*. 27*m*. at which time the moon's horary motion from the sun is 35′ 33″. At this time, computing the true places of the sun and moon, the moon will appear to be 35′ 10″ before the sun. And therefore the time is past the syzygy, 59*m*. 12*s*. Therefore,

	d	*h*	*m*	*s*
From	1	19	27	0
Take	0	0	59	12
True time	1	18	27	48

The places being computed again, the moon is only 7″ before the sun, which amounts to 12*s*. of time; therefore the time of opposition is 12*d*. 18*h*. 27*m*. 36*s*. which reduced to apparent time is Dec. 12*d*. 18*h*. 32*m*. 51*s*.

2. The sun's place is	8	21°	37′	35″
The moon's place	2	21	37	35
Place of the ascending node	8	14	46	13
Her latitude south			37	58
The sun's horary motion			2	33
The moon's horary motion			38	6

3. Hence the moon is 6° 51′ 22″ past the descending node; that is ☊ S is 6° 51′ 22″. Therefore ☊ A = 17′ 32″, and ☊S = 6° 23′ 50″. Therefore the angle SMA = 84° 22′ 28″.

4. Hence drawing the ecliptic RS, and SM perpendicular to it, and equal to 37′ 58″ from a scale of minutes, as in Fig. 3. Plate XXX. and making the angle SMA = 84° 22½. We find the perpendicular SP = 37′ 47″, and MP = 3′ 43″. And therefore, the horary motion of the moon from the sun being 35′ 33″, PM will be passed over in 6′ 17″. And since this is before the opposition at M, this time must be deducted from the time of opposition. And the time of the middle of the eclipse will be Dec. 12*d*. 18*h*. 26*m*. 34*s*.

5. The sun's apparent semidiameter	16′	20″	
His horizontal parallax		12	
The moon's apparent semidiameter	16	48	
Her horizontal parallax	61	7	

6. Hence the radius BP = 16′ 48″.
Radius SD = 44 59.
Radius SF = 77 39.

7. Hence also PK or P*k* = 86′ 34″.
and PI or P*i* = 48 53.

and therefore the time of passing through PK is 2*h* 26′ 6″, and through PI = 1*h* 22′ 30″. And the whole duration in the shadow from I to *i*, is 2*h* 45*m*. And the digits eclipsed 8½ on the upper side. Whence,

First ent. the penumbra Dec. 13*d*	4*h*	0*m*	28*s* morn.
Entering the dark shadow at	5	4	4
Middle	6	26	34
Opposition	6	22	51
Leaving the shadow	7	49	4
Leaving the penumbra	8	52	40
Duration	2	45	0

Digits eclipsed 8½.

(624.) All these calculations may be made sufficiently near, by scale and compasses, in a large draught; making use of a scale of minutes and sixtieth parts; or rather by making a scale of time answering thereto, by the help of the horary mo-

tion of the moon from the ſun. For by this ſcale, the ſeveral hours and minutes may be marked along the line A*k*, by which it will appear at what time the centre of the moon is at any given point. For the time is known when the moon is at M, and from thence the points at each hour and minute are eaſily found. And this conſtruction, with only right lines and circles, will be exact enough in a large figure; for the beſt lunar tables give the times of the phaſes of an eclipſe no nearer than to 4 or 5 minutes of time; and therefore ſuch a conſtruction is ſufficient to anſwer the purpoſe. Hence it may be obſerved, that no eclipſe of the moon can laſt above 5¼ hours, from the moon's firſt touching the earth's penumbra, to its laſt leaving it. For SK=94′ 27″=94.45, and the horary motion is 35′ 33″=35.55 and $\frac{94.45}{35.55} = 2.66 =$ 2^h 39^m = ſemiduration; and no eclipſe of the moon, by the earth's ſhadow, can laſt above 3¼ hours. Nor when total, above 1¼ hours. For SI = 61′ 47″ = 61.78, and $\frac{61.78}{35.55} = 1.745 =$ 1′ 45″ = the ſemiduration and SD — SI = 28′ 11″ =28.18, and $\frac{28.18}{35.55} = .79 =$ 47^m, the ſemidurat.

(625.) The refraction of the earth's atmoſphere, in lunar eclipſes, makes the ſhadow leſs; by bringing the rays, which terminate the ſhadow, ſooner to a point. And hence comes that red colour of the moon even in total eclipſes. But that light muſt be very dim, by reaſon a great number of the rays are ſtopt and loſt in the earth's atmoſphere.

(626.) The circles terminating the ſhadow and the penumbra BED and GQF, cannot be diſtinguiſhed. For the darkneſs from BED, diminiſhes by inſenſible degrees, to GQF, being darkeſt at E, and lighteſt at Q, where it vaniſhes inſenſibly. And therefore the moon does not appear to be eclipſed till ſhe is a good way within the penumbra. For that reaſon, there may happen eclipſes of the moon which cannot be diſcovered as ſuch.

(627.) All lunar tables ſhew the moon's place in eclipſes, more truly in the ſyzygies than in the quadratures, or any other place. For the times of the ſyzygies, and the moon's place, have been more accurately obſerved in eclipſes, than at any other time; and from thence the moon's theory has been deduced. Beſides, many of the inequalities ceaſe in the ſyzygies, but have ſenſible effects in other places; becoming greater, as the moon is further from the ſyzygies; being greateſt in the quadratures. Whence the lunar tables do not determine the moon's place truly in the quadratures. And her place calculated from theſe tables is not ſo exact in the quadratures as in the ſyzygies.

(628.) Several inequalities depend on the aſpect of the nodes and the ſun; but theſe ceaſe when the nodes are in the ſyzygies. When the moon and the nodes are in the ſyzygies; the moon's place, then wanting fewer equations, as being ſubject to fewer inequalities, will be more correct, than when ſhe is in other places, where there are more and greater inequalities, and more equations. From hence more errors will happen out of the ſyzygies than in them.

V. *To* FIND *the* WAY *of the* MOON *from the* SUN, *in a* SOLAR ECLIPSE, *ſuppoſing the* OBSERVER *at* REST.

(629.) Let HZO, in PLATE XXXI. fig. 2, be the meridian of the place, HO the horizon, EC the equinoctial, EL the ecliptic, Z the zenith, P the pole, S and M the places of the ſun and moon in conjunction, PSD the ſun's meridian. Having found the ſun's diſtance from the node, ☊ S, and the moon's latitude SM, &c. take ☊ A to ☊ S, as the ſun's horary motion to the moon's horary motion; then SA is known. Draw MA; then in the ſpherical triangle ASM, right angled at S, there is given SA, SM; to find the angle SMA; AM being the moon's way from the ſun.

(630.) But, as the eye of the obſerver is in motion, by the rotation of the earth, which gives an apparent motion to the moon, contrary to that of the obſerver, we muſt find the quantity and direction of that motion. As the obſerver is carried eaſtward, toward the point C, the apparent motion of the moon cauſed thereby will be in the line CS. And to determine the poſition of CS in reſpect of AM or SM, ſeveral ſpherical triangles muſt be reſolved, as follows:

(631.) In the right-angled triangle EDS, there is given ES and angle E to find DS and angle ESD or ASP; or theſe may be eaſier had from the aſtronomical tables. And in the triangle ZPS, there is given PS (the complement of DS), the angle ZPS (from the time of the day), and ZP the complement of the latitude; to find ZS, and angles PZS and ZSP. Then ZSP and ASP being known, ZSA will be known. And MSA being a right angle, ZSM will be known. In the right angled triangle CFS, there is given CF, the meaſure of the angle FZC (the difference between the angle PZS and the right angle CZP), and SF the complement of ZS; to find CS, and the angle CSF or BSZ. Then BSZ and ZSM being known, BSM will be known. And SMA being known, its ſupplement SMB is known, and conſequently the angle SBM.

(632.) To find the quantity of the motion. That along AM is already known; and to find the apparent motion along SB. The line of 15° (the horary motion of a point in the equinoctial) is .259 to the radius 1. And if *h* be the moon's horizontal parallax, then the radius of the earth appears at the moon under the angle *h*, and therefore 15° of the equinoctial appears under the angle of .259*h*; this then is the horary motion of a point in the equinoctial, viewed directly from the moon. And the moon's apparent motion ſeen from that point in the equinoctial is the very ſame. But this motion is to be diminiſhed upon two accounts. 1. Becauſe it is leſs in a parallel circle, in proportion to the coſine of the latitude. And 2. Upon account of the obliquity of the motion, when not perpendicular to the rays of the ſun; and this will be as the line of CS, the ſun's diſtance

from

from the east or west point of the horizon. Therefore to find the quantity of this motion.

To the logarithm of .255*b*
Add the cosine latitude
And the line of CS.

Then the sum abating twice radius, is the logarithm of this apparent horary motion. Then this motion is to be compounded with the motion along AMB as follows.

(633.) Let AS, PLATE XXXI. fig. 3, be a portion of the ecliptic, SB the way of the apparent motion, MA the moon's way from the sun. Draw NM parallel to SB; and let MN be the horary motion along SB or MN, and MI the horary motion of the moon from the sun. Then complete the parallelogram NMIQ; draw the diagonal MQR, which is the direction of the motion, compounded of the observers and the moon's motions, and MQ is the total apparent horary motion, supposing the observer at rest. Then in the plain triange QMI, there is given MI, and IQ (or MN), and the angle MIQ = M2S; to find the angle QMI, and side MQ or the absolute horary motion. And the angles QMI and IMS being known, QMS is known.

(634.) If the sun be in the eastern hemisphere, in which case the concave side of the eastern hemisphere is here projected (in fig. 2.), then the moon's motion from the sun is from M towards A, and the other apparent motion from S towards B, or from M towards N. But if the sun is in the western hemisphere, this projection represents the convex side of the sphere; and then the moon moves from the sun, in direction AM, and the other apparent motion is from S toward C, being contrary.

VI. *To* CALCULATE SOLAR ECLIPSES.

(635.) The eclipses of the sun are more difficult to calculate, than those of the moon; the latter being clear of parallaxes, which the former are incumbered with, which gives a great deal of trouble. But a great part of it may be avoided by using *projections* instead of calculations. The rules are,

(636.) I. Find the true time of the conjunction, and the places of the sun and moon at that time.

(637.) II. Having found the way of the moon from the sun by projection or calculation; find, by the astronomical tables, the moon's horizontal parallax, her apparent diameter, and horary motion; also the sun's apparent diameter, and horary motion. But, to avoid a great deal of calculation, if the sphere be projected by a large scale, it will give all the requisites with sufficient exactness, by measuring the several angles and sides, without any calculation, or very little. And here it is best to project the concave side, and then every thing appears as it is in nature.

(638.) III. Find the moon's parallax of altitude, by making as rad : cos. altitude : : so the moon's horizontal parallax : to her parallax of altitude V*t* or M*m*. fig. 4. Then find her parallax of latitude M*n*, and longitude S*s*, or *ms*, and from thence her apparent latitude and longitude is known.

(639.) IV. Draw the line SL, fig. 5. for the ecliptic, and from a large scale of minutes, erect SM perp. to LS, and equal to the apparent latitude; make the angle SMR, as found in the last prob. and draw 8 MR for the moon's apparent path. From S let fall SP perpendicular to MR, and SP will be the least distance of the centres of the sun and moon, or the middle of the eclipse. From the centre S with the radius equal to the minutes contained in the sun's semidiameter, describe the circle ABC for the sun. And from the centre P, with the radius equal to the moon's semidiameter, describe the circle AOCD for the moon. If these circles do not intersect, there will be no eclipse. But if they intersect, an eclipse must necessarily happen.

(640.) V. Then P is the place of the moon in the middle of the eclipse. Make SI and SK equal to the sum of the semidiameters of the sun and moon; and the moon's centre will be at I when the moon first touches the sun, or at the moon's centre, at the end of it. In the triangle PSI, there is given SI, SP; to find PI=PK, which reduced to time, by help of the moon's apparent horary motion, shews half the duration of the eclipse; and consequently we shall have the beginning and end.

(641.) VI. And to find the quantity *no*, or the digits eclipsed; we have $no = Sn + Po - SP$,

and $\frac{6no}{Po}$ = number of digits.

(642.) VII. The time found being mean time, it must be reduced to the common or apparent time, by the equation of time. And if the given place be not that for which the tables are made, add so much time, if the place lie eastward, to the time of conjunction, as answers to the difference of meridians; or subtract it, if it lie westward.

(643.) EXAMPLE.

To FIND *the* TIME *of the* SUN'S ECLIPSE, *June* 4, 1769, *its* DURATION *and* DIGITS ECLIPSED *at* LONDON.

1. By the tables the mean time of the conjunction is found to be June 2^d 20^h 41^m. And hence the true time of conjunction is June 3^d 20^h 27^m 43″. And their places are 2^s 13° 51′ 25″. And the moon's lat. 55 32 north. The moon's motion from the sun 35′ 47″.

2. In fig. 2, and 3, Plate XXXI, the angle AMS = 84° 47′. ZSM = 35° 20′. CSP = 5° 18′. SBM = 43° 49′. SF = 42° 16′, CF = 3° 34′. CS = 42° 24′. The angle QMI = 8° 25′. SMQ = 92° 52′. MN or IQ = 6° 38′. MQ = 31° 20′. Also

The moon's horizontal parallax	60′	58″
Her apparent diameter -	33	32
Her horary motion - -	38	10
The sun's diameter - -	31	41
His horary motion - -	2	23

3. In fig. 4. the moon's parallax in altitude M*m* is 45′ 09″; her parallax in latitude M*n*, 38′ 05″; her remaining latitude S*n*, 17′ 26″; her parallax in longitude S*s*, 24′ 13″; which is increased so much.

4. Draw SL for the ecliptic, as in fig. 5; at any point S, erect the perp. MS equal to 17′ 26″, the moon's apparent latitude; through M draw the moon's way 8 MR, making the angle SMR = 92° 52′. Draw SP perp. MR, which here falls

very

very near M. From the centre S, with the radius SA = 15′ 50″ describe the circle ABC for the ſun. And with the radius MD = 16′ 46″, and centre P, deſcribe the circle ADCO for the moon.

5. Hence PI or PK = 27′ 33″. And the time of moving through IP or PK, at the rate of 31′ 20″ an hour, is $52^m\ 45^s$, for the ſemiduration.—By reaſon of the parallax (24′ 13″), ſhe is paſt the apparent conjunction; the difference being what the parallax cauſes, which comes to $47^m\ 23^s$. Therefore the middle of the eclipſe is ſo much ſooner, being at $3^d\ 19^h\ 41^m\ 20^s$. This reduced to apparent time is $3^d\ 19^h\ 43^m\ 27^s$, for the middle.

6. The digits eclipſed are $5\ \frac{4}{6}$, nearly.

(644.) In this example, the concave ſide of the ſphere is projected, which ſuits beſt to the appearance of the heavens. And the figures are drawn upon that ſuppoſition. It appears from the proceſs that the moon is advancing to her deſcending node, and therefore has north latitude. And by the poſition of that part of the ecliptic, her parallax in longitude, advances her ſo much forward, viz. 24′ 13″. And therefore ſhe is ſo much paſt the apparent conjunction. Hence we gain theſe ſeveral particulars, as to the eclipſe:

(645.) I. The begin. June $4^d\ 6^h\ 53^m$ 42s morn.

middle,	4	7	43 27
end,	4	8	46 12
total duration,		1	45 30

digits eclipſed $5\frac{1}{2}$, on the upper ſide of the ſun, towards the left; as appears by the figure.

(646.) II. Hence the POSITION of the HORNS at C and A, are eaſily found in the middle of the eclipſe. For they are in a poſition parallel to RI, the moon's way.

(647.) III. The MIDDLE of the eclipſe will not be at the ſame time in all places of the ſame longitude. For the parallax of longitude will be different in different places.

(548.) No eclipſe of the ſun can laſt above two HOURS. For SI or SA + MD = 32′ 26″ = 32.6 and the horary motion = 34′ 47″ = 35.78. And $\frac{32.6}{35.78} = .91 = 54\frac{1}{2}$ minutes, for the ſemiduration.

(649.) If it were not for the parallax, eclipſes of the ſun would be as eaſily calculated, as thoſe of the moon. And in order to get the parallax, the angle ZSM and SP muſt be known fig. 2, which occaſions the reſolving ſeveral ſpherical triangles before they can be had. Likewiſe it may be obſerved, that the apparent way of the moon is ſtrictly curve line, concave towards S, which ariſes from the parallel of latitude being a curve, and the moon being out of its plane. Likewiſe the moon's apparent velocity is ſomething greater at the beginning than at the end.

VI. RULES *for* CALCULATING *a* GENERAL ECLIPSE *of the* SUN.

(650.) The elements neceſſary for this are. 1. The ſun and moon's place, and the time, at the true conjunction; 2. The moon's latitude, horizontal parallax, diameter, and horary motions, 3. The ſun's declination, diameter, and horary motion; And 4, the angle the moon's way makes with a circle of latitude.

(651.) II. From a large ſcale of minutes, take the moon's horizontal parallax in the compaſſes, and at any point C, in the right line BD (which repreſents the ecliptic in Plate XXXII. fig. 2,) deſcribe the circle ABED, for the earth's diſk, or the earth's flat face as it appears at a diſtance, in a line drawn to the ſun. Draw CM perpendicular to CD, and equal to the latitude of the moon upwards, if north. Make the angle CMG equal to that which the moon's way makes with a circle of latitude; acute to the right hand, if ſhe tend to the node; or obtuſe, if ſhe be paſt it; and drawing FMG, it will be the way of the centre of the moon's ſhadow upon the earth. From C let fall CH perpendicular to FG. Then at H will be the middle of the earth's eclipſe.

(652.) III. With the centre H, and radius HO, equal to the ſum of the ſemidiameters of the ſun and moon, deſcribe the circle QOR, which will be the moon's penumbra. Alſo deſcribe a ſmall circle round the centre H, whoſe radius is the difference of the ſun and moon's ſemidiameters, that little circle will be the dark ſhadow of the moon. Then all the countries of the earth contained in the ſegment VAW will be ſucceſſively eclipſed, by the penumbra, as the ſhadow moves along the tract FG; while the other ſegment VEW ſuffer no eclipſe at all. All places in the line *st*, will be totally eclipſed, as the dark ſhadow, or the ſmall circle at H paſſes ſucceſſively over them. But this circle, or dark ſhadow, being very ſmall, a total eclipſe at any place continues but a ſmall time. Sometimes the ſun's ſemidiameter exceeds the moon's; and then there will be no dark circle, or total eclipſe, but a lucid ring will appear about the moon in theſe places; and this is called an *annular eclipſe*. The difference between the ſemidiameters of the ſun and moon is ſo little, that no total eclipſe laſts above 4 minutes.

(653.) IV. Draw CF, CG = ſum of the ſemidiameters of the ſun and moon, and the moon's parallax; then the moon's ſhadow will touch the earth at L and K where the eclipſe begins and ends. In the triangle CFH, there is given CF, CH; to find FH = HG, which converted into time, gives half the duration, or half the time that the moon's ſhadow is upon the earth. Alſo, NO meaſured, ſhews how far the eclipſe reaches. Or CO meaſured does the ſame. It may be ſufficient to meaſure all theſe by the ſcale without calculation.

(654.) V. To find the POLE. Draw the arch AP, making the angle KAP equal to the ſun's longitude, and AP, the diſtance of the poles of the equator and ecliptic, 23°½; then P is the pole. For AP is a part of the ſolſtitial colure, and paſſes through Cancer and Capricorn. And CAP is what the ſun wants of Cancer, therefore PAK is what it is paſt Aries. Through P draw CPT. And here we may ſuppoſe that the pole P is fixed, during the time of an eclipſe. Then in the right angled ſpherical triangle APT, there is given AP and angle A; to find AT or angle ACP. In this triangle PT is the ſun's declination, and AT or CPK his right aſcenſion from Cancer. Here note that any place in the line CT is in the ſun's me-

ridian

idian. And C is the place where the ſun is verical at the time of the eclipſe.

(655.) VI. To find the SITUATION of any given place, at a given hour. Make the angle CPX with the ſun's meridian), equal to the time from noon; on the left hand, if it is before noon. And make PZ the complement of the latitude; then Z s the place required. And if it falls in the penumra, it is eclipſed; or any where in the ſegment AW; if its motion in the parallel circle do not arry it out, before the penumbra reaches it.

(656.) VII. To find the place which is firſt or aſt touched by the penumbra, as K. Draw he arch PK. In the triangle CGA, there are iven CG and CH, to find the angle GCH, rom which ſubtract HCP which is known, gives he angle PCK or TK. Then in the right angled pherical triangle PTK, there is given TK, and PT the ſun's declination; to find PK the complenent of the latitude of K, and TPK or CPK he difference of longitude of K, and the ſun. Therefore its longitude and latitude is obtained. n the ſame manner may be found that of L. And y the ſame method the latitude and longitude of he places *s* and *t* may be found, where the dark hadow firſt enters the earth's diſk, or quite leaves t. Thus alſo may be found the place which is in he line FH, at any point of time: or if the place e given, what the time will be; and that by help of the horary motion, with other particulars of ike nature.

(657.) VIII. The part of the ſun's diameter eclipſed by the moon, is known by the ſituation of he place within the penumbra, or its diſtance rom the centre of the penumbra. And the phaſis of the eclipſe, as ſeen from any place Z, upon he diſk, will be found thus, for any time. Find he centre of the ſhadow for that time, as ſuppoſe it H. Deſcribe about H, a circle whoſe radius s the moon's radius, and about Z, a circle with he ſun's radius. Then the part cut off the ſun's circle will be the part obſcured.

SECT. VIII. REMARKS *on* ECLIPSES *in* GENERAL.

(658.) In eclipſes of the moon, even when ſhe is near the centre of the earth's ſhadow, her body is ſtill viſible and appears of a tarniſhed *copper colour*. This ſeems to be occaſioned by the rays of light which come from the ſun, and which, paſſing near the earth, are inflected from their rectilinear courſe by our atmoſphere; ſo that they enter the earth's conical ſhadow, and thus produce that faint illumination on the ſurface of the moon, which ſome have ſuppoſed to be her own native light: but there ſeems to be no juſt ground for ſuch a conjecture.

(659.) In moſt ſolar eclipſes, the moon's diſk is covered with a faint light which is attributed to the reflection of the light from the illuminated part of the earth, and in total eclipſes, the moon's limb is ſeen ſurrounded by a pale circle of light; which ſome aſtronomers conſider as an indication of a lunar atmoſphere, but others as the atmoſphere of the ſun; becauſe it is obſerved to move equally with the ſun, but not with the moon.

(660.) ECLIPSES have in all ages greatly attracted the attention of mankind. The ignorant and ſuperſtitious have viewed them with terror, and in former ages they were often conſidered as the forerunners of national calamities. The CHINESE, even at the preſent day, upon their appearance, perform the moſt abſurd and ſuperſtitious ceremonies, although they are ſo far acquainted with their nature, as to be able to predict them. See CHINA. But true philoſophy has taught us, that inſtead of theſe appearances being portentous of *evil* to mankind, they may, by proper obſervations upon them, be made of great advantage to the ſciences, and to ſome of the arts of life.

(661.) We have already ſhewn, that, by eclipſes of the moon, the earth is demonſtrated to be a globular figure. The longitudes of places on the earth are alſo determined by obſervations on ſolar and lunar eclipſes; as will appear by conſulting the articles GEOGRAPHY, LONGITUDE, NAVIGATION, &c. Eclipſes are alſo of great importance in CHRONOLOGY, (which ſee,) as by them we are enabled to determine exactly the time when events recorded in hiſtory happened.

(662.) From obſervations made upon the ancient eclipſes, it appears, that the PERIOD of the moon is now ſhorter, and conſequently that her DISTANCE from the earth is now leſs, than in former ages; and this has been conſidered as an argument againſt thoſe who aſſert, that the world may have exiſted from eternity; for it was hence inferred, that the moon moves in a reſiſting medium, and therefore that her motion muſt by degrees be all deſtroyed, in which caſe ſhe muſt at laſt come to the earth. But M. DE LA PLACE has ſhewn, that this acceleration of the moon's period is a neceſſary conſequence of univerſal gravitation, and that it ariſes from the action of the planets upon the moon. He has alſo ſhewn, that this acceleration will go on, till it arrive at a certain limit, when it will be changed into a retardation; or in other words, that there are *two* limits, between which the lunar period fluctuates, but neither of which it can paſs.

(663.) M. DE LA GRANGE has alſo diſcovered, that all the ſeeming irregularities in the motions of our ſyſtem are periodical; ſo that although the obliquity of the ecliptic, the excentricities of the planetary orbits, the preceſſion of the equinoxes, the length of the year, &c. may change, yet theſe changes will not paſs certain limits, and after ſtated periods, they will return preciſely to what they had formerly been. Some of theſe periods, however may be very long. The acceleration of the moon, for example, has been going on from the earlieſt ages of aſtronomy to the preſent day.

(664.) We cannot cloſe this ſection, without obſerving, that ECLIPSES happen very frequently to the SATELLITES of JUPITER; and, as they are of great ſervice in determining the longitude of places on the earth, aſtronomers have been at pains to calculate tables for the eclipſes of theſe ſatellites, by their primary, for the ſatellites themſelves have never been obſerved to eclipſe one another. But this falls more properly to be conſidered under the articles GEOGRAPHY and LONGITUDE, to which the reader is therefore referred.

(665.) The primary planets would alſo eclipſe one another, were it not for their great diſtances; but as the comets are not ſubject to the ſame laws with the planets, it is poſſible they may ſom times

approach

approach so near to the primary planets, as to cause an eclipse of the sun to those planets; and as the body of a comet bears a much larger proportion to the bulk of a primary planet than any secondary, it is plain, that a cometary eclipse would both be of much longer continuance, and attended with greater darkness, than that occasioned by a secondary planet. If we suppose the primary planet and comet to be moving both the same way, the duration of such an eclipse would be prodigiously lengthened; and thus, instead of four minutes, the sun might be totally darkened to the inhabitants of certain places for as many hours: and, from this cause, some account for that prodigious darkness, which we sometimes read of in history at times when no eclipse of the sun by the moon, could possibly happen.

PART V.

ASTRONOMICAL MACHINERY AND INSTRUMENTS.

SECT. I. DESCRIPTION *of the* ASTRONOMICAL MACHINERY *invented for* ILLUSTRATING *the* SCIENCE.

(666.) The GRAND ORRERY, a very magnificent machine, first made in this kingdom, by Mr Rowley, for King George I, is represented in Plate XXXIII. fig. 1. The frame of it, which contains the wheel-work, &c. and regulates the whole machine, is made of ebony, and about four feet in diameter. Above the frame is a broad ring, supported with 12 pillars, which represents the plane of the ecliptic. Above the ecliptic, stand some of the principal circles of the sphere, viz. N° 10, are the two colures divided into degrees, and half degrees; N° 11, is one half of the equinoctial circle, making an angle of 23½ degrees. The tropic of Cancer, and the arctic circle, are each fixed parallel, at their proper distance from the equinoctial. On the northern half of the ecliptic, is a brass semicircle, moveable upon two points, fixed in ♈ and ♎, representing the moveable horizon to be put to any degree of latitude upon the north part of the meridian, and the whole machine may be set to any latitude, without disturbing any of the internal motions, by two strong hinges, (N° 13.) fixed to the bottom-frame, upon which the instrument moves, and a strong brass arch, having holes at every degree, through which a strong pin is put at every elevation. This arch, and the two hinges, support the whole machine, when it is lifted up, according to any latitude; and the arch, at other times, lies conveniently under the bottom frame.

(667.) The Sun, (N°. 1.) stands in the middle of the whole system, upon a wire, making an angle with the ecliptic, of about 82 degrees.—Next the sun is a small ball, (2) representing Mercury. Next to Mercury is Venus, (3) represented by a larger ball. The earth is represented, (N° 4.) by an ivory ball, having some circles and a map sketched upon it. The wire which supports the Earth, makes an angle with the ecliptic, of 66½ degrees, the inclination of the earth's axis to the ecliptic. Near the bottom of the Earth's axis is a dial plate, (N° 9.) having an index, pointing to the hours of the day, as the Earth turns round its axis. Round the Earth is a ring supported by two small pillars, representing the orbit of the moon; and the divisions upon it shew to the moon's latitude. The motion of this ring represents the motion of the moon's orbit according to that of the nodes. Within this ring is the moon, (N° 5.) having a black cap or cover by which its motion represents the phases of the moon, according to her age. Without the orbit of the Earth and Moon, is Mars, (N° 6.) The next in order to Mars is Jupiter, and his four moons (N° 7.) Each of these moons is supported by a wire fixed in a socket, which turns on the pillar supporting Jupiter. These satellites may be turned by the hand to any position, and yet, when the machine is put into motion, they will all move in their proper times. The outmost of all is Saturn, his five moons, and his ring (N° 8.) These moons are supported and contrived, similar to those of Jupiter.

(668.) The machine is put into motion by turning a small winch, (N° 14); and the whole system is also moved by this winch, and by pushing out, and pushing in a small cylindrical piece above the handle. When it is pushed in, all the planets, both primary and secondary, will move according to their respective periods, by turning the handle. When it is drawn out, the motion of the satellites of Jupiter and Saturn will be stopped, while all the rest move without intermission. There is also a brass lamp, having two convex glasses, to be put in room of the sun; and also, a smaller earth and moon, made somewhat in proportion to their distance from each other, which may be put on at pleasure. The Earth turns round, at the same time with the earth, and the glasses of it cast a strong light upon her: when the smaller earth and moon are placed, it will be easy to show when either of them will be eclipsed.

(669.) Mr FERGUSON's ORRERY, *fig.* 2. shows the motions of the Sun, Mercury, Venus, Earth and Moon; and occasionally the superior planets Mars, Jupiter, and Saturn, may be put on. Jupiter's four satellites are moved round him at their proper times, by a small winch; and Saturn with his five satellites, and his ring, which keeps parallelism round the sun; and by a lamp put in the Sun's place, the ring shows all its various phases already described. In the centre, N° 1, represents the Sun; N° 2, Mercury; N° 3, Venus; N° 4, the Earth; N° 6, is a sidereal dial-plate under the Earth; and N° 7, a solar dial-plate on the cover of the machine. The motion of the former shows sidereal time, and of the latter, solar time.

(670.) The Earth always keeps opposite the moving index, (N° 10.) which shows the daily change of place, and also the days of the months. The Earth is half covered with the cap, for dividing the apparently enlightened part next the Sun, from the other half, which is turned away from him, is in the dark. The edge of the cap represents the circle between light and darkness, and shows at what time the sun rises and sets to all places through [illegible]. The Earth's axis inclines 23½ degrees

GRAND ORRERY
made for king GEORGE I.

Fig. 1.

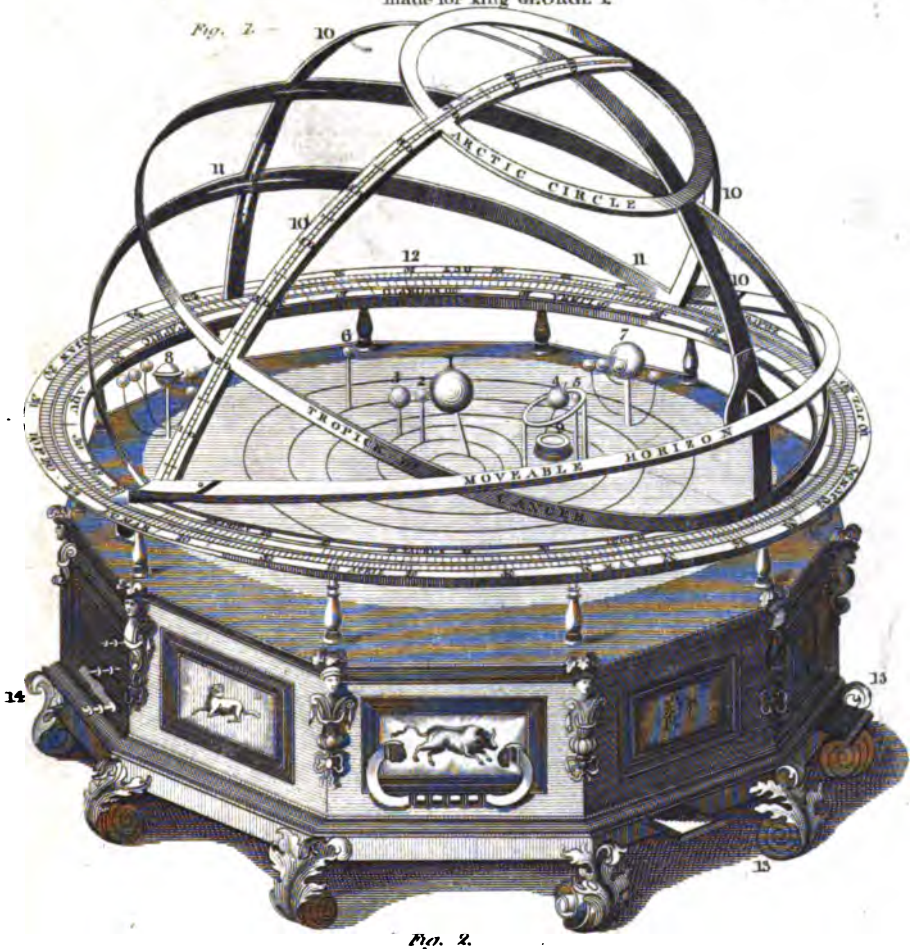
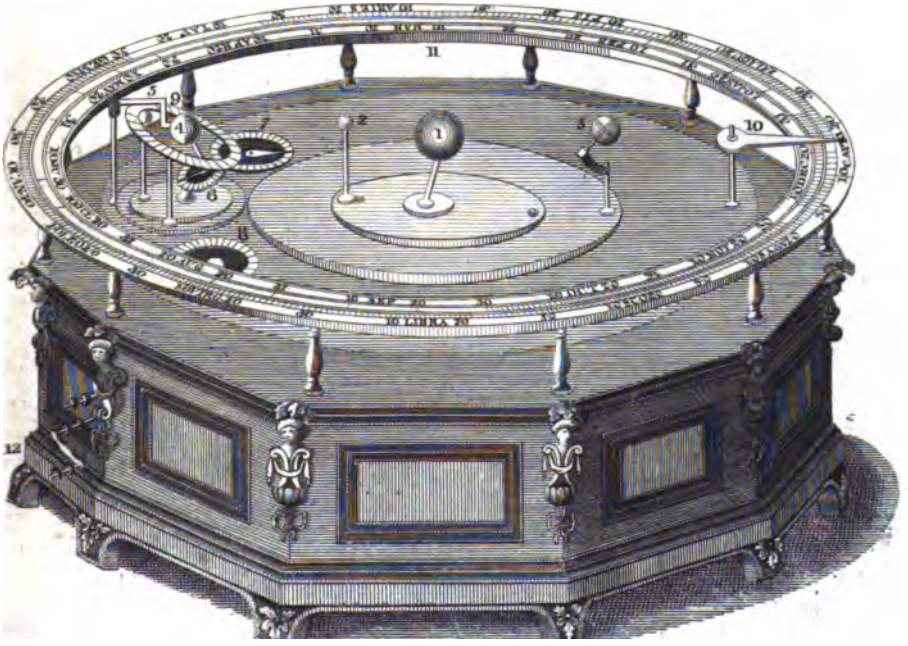


Fig. 2.

M^r. FERGUSONS ORRERY



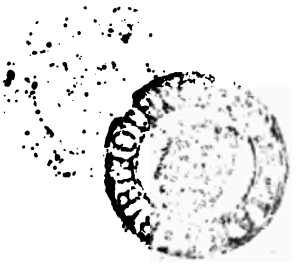


Fig. 1. Planetarium by Jones.

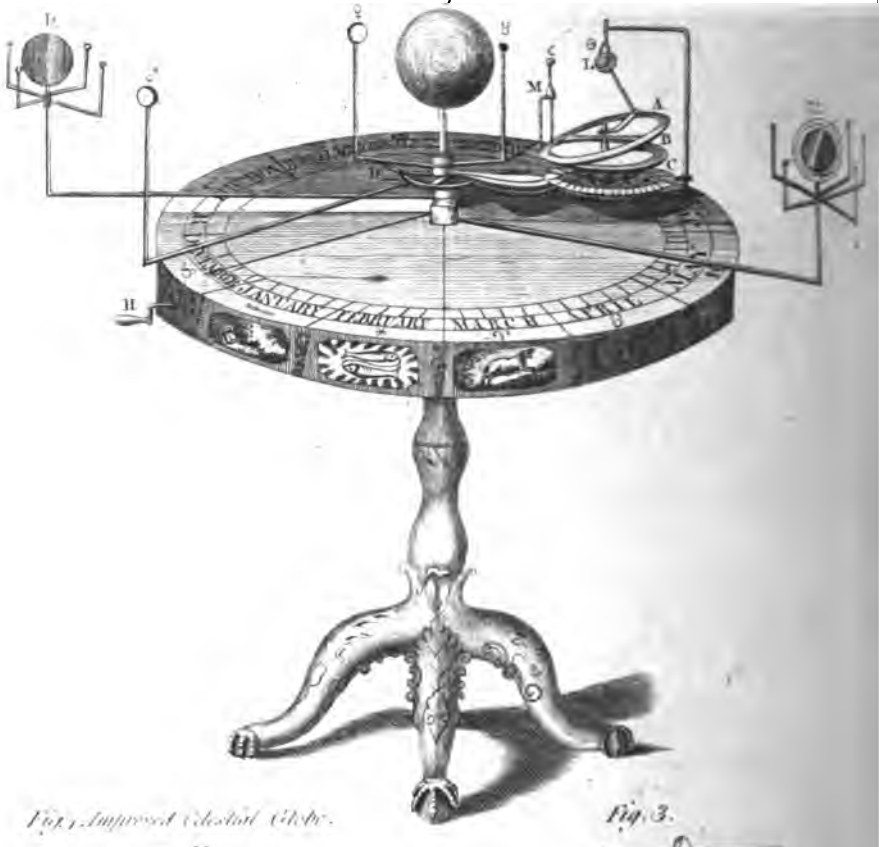


Fig. 1. Improved Celestial Globe.

Fig. 3.

Fig. 2.

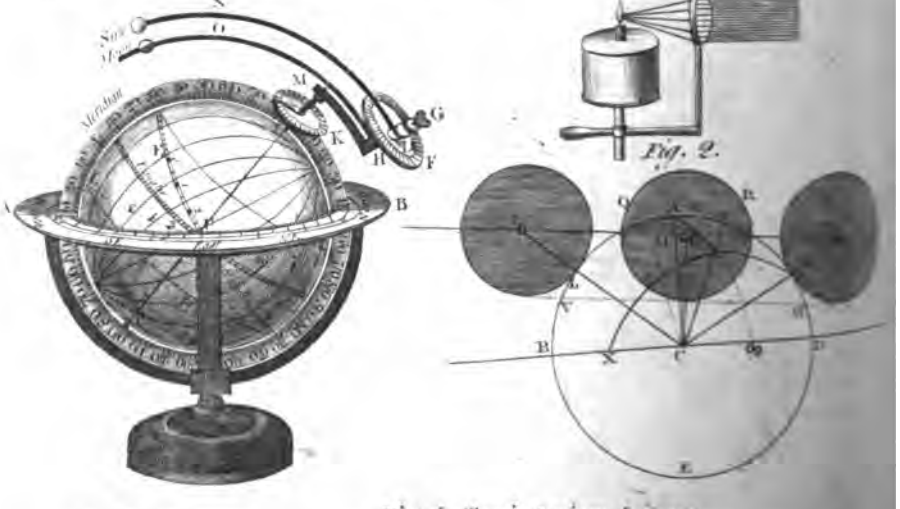


Fig. 5. Trajectorium Lunare

is of the ecliptic; by which means, the diffe-
nt lengths of days and nights, and the cauſe of
e various ſeaſons, are demonſtrated to ſight.

(671.) There is a broad horizon, to the upper
le of which is fixed a meridian ſemicircle, in the
rth and ſouth points. From the lower ſide of
is thin horizontal plate ſtand out 4 ſmall wires,
which is fixed a twilight-circle, 18 degrees
m the graduated ſide of the horizon, all round.
his horizon may be put upon the earth, (when
: cap is taken away,) and rectified to the lati-
de of any place; and then by a ſmall wire, cal-
l the *ſolar ray*, which may be put on, ſo as to
oceed directly from the ſun's centre towards
: earth's, but to come no farther, than almoſt
touch the horizon. The beginning of twilight
ne of ſun riſing, with his amplitude, meridian
itude, time of ſetting, amplitude then, and
d of twilight, are ſhown for every day of the
ar, at that place to which the horizon is recti-
d.

(672.) The Moon, (N° 5.) exhibits all the
aſes already deſcribed. When the horizon is
ſtified to the latitude of any given place, the
nes of the Moon's riſing and ſetting, together
th her amplitude, are ſhown to that place, as
ll as the ſun's; and all the various phænomena
the harveſt moon, are made obvious to ſight.
ie Moon's Orbit, (N° 9.) is inclined to the e-
ptic, (N° 11.) one half being above, and the
ier below it. The nodes, or points at ○ and ☋,
in the plane of the ecliptic, as before deſcri-
d, and ſhift backward, through all its ſines and
grees, in 18⅔ years.

(673.) The degrees of the Moon's latitude, to
: higheſt at NL, (north latitude,) and loweſt
SL, (ſouth latitude,) are engraven both ways
om her nodes at ○ and ☋; and, as the moon
es and falls in her orbit, according to its incli-
tion, her latitude and diſtance from her nodes
: ſhown for every day, having firſt rectified her
bit, ſo as to ſet the nodes to their proper places
the ecliptic; and then, as they come about, at
ferent, and almoſt oppoſite times of the year,
d then point towards the ſun, all the eclipſes
ay be ſhown for hundreds of years, (without a-
new rectification,) by turning the machinery
ckward, for time paſt, or forward for time to
me.

(674.) At 17° diſtance from each node, on both
es, is engraved a ſmall ſun; and at 12 degrees
tance, a ſmall moon, which ſhow the limits of
ar and lunar eclipſes: and when, at any change,
: moon falls between either of theſe ſuns and
: node, the ſun will be eclipſed on the day
inted to by the annual index, (N° 10.) And
ien at any full, the moon falls between either
the little moons and node, ſhe will be eclipſed,
d the annual index ſhows the day of that e-
pſe. There is a circle of 29½ equal parts, (N°
on the cover of the machine, on which an in-
x ſhows the days of the moon's age. There is
ointed wire, of which, one end being put into
ole in the upright ſtem that holds the earth's
, and the wire laid into a ſmall forked piece,
hich may be occaſionally put upon Venus or
ercury, ſhows the direct and retrograde moti-
s of theſe two planets, with their ſtationary
times and places, as ſeen from the earth. The whole machinery is turned by a winch, (N° 12.) and is ſo eaſily moved, that a clock might turn it, without any danger of ſtopping.

(675.) Mr JONES's PLANETARIUM, *Pl.* XXXII. *fig.* 1. repreſents in a general manner, by various parts of its machinery, all the motions and phænomena of the planetary ſyſtem. This machine conſiſts of, the Sun in the centre, with the planets, Mercury, Venus, the Earth and Moon, Mars, Jupiter and his four moons, Saturn and his five moons; and to it is occaſionally applied an extra long arm for the planet Herſchel and his two moons. To the earth and moon is applied a frame CD, containing only four wheels and two pinions which ſerve to preſerve the earth's axis in its proper parallelism in its motion round the ſun, and to give the moon her due revolution about the earth at the ſame time. Theſe wheels are connected with the wheel-work in the round box below, and the whole is ſet in motion by the winch H. The arm M that carries round the moon, points out on the plate B her age and phaſes for any ſituation in her orbit, and which accordingly are engraved thereon. In the ſame manner the arm points out her place in the ecliptic B, in ſigns and degrees, called her geocentric place. The moon's orbit is repreſented by the flat rim A; the two joints of which, and upon which it turns, denoting her nodes. This orbit is made to incline to any deſired angle. The earth of this inſtrument is uſually made of a three inch or 1¼ globe, papered, &c. for the purpoſe; and by means of the terminating wire that goes over it, points out the changes of the ſeaſons, and the different lengths of days and nights more conſpicuouſly. This machine is alſo made to repreſent the Ptolemaic ſyſtem, or ſuch as is vulgarly received; which places the earth in the centre, and the planets and ſun revolving about it. This is done by an auxiliary ſmall ſun and an earth, which change their places in the inſtrument.

(676.) The true cauſes of the ſolar and lunar eclipſes are here very clearly ſeen; for by placing the lamp, *fig.* 3. upon the centre, in room of the braſs ball denoting the ſun, and turning the winch until the moon comes into a right line between the centres of the lamp (or ſun) and the earth, the ſhadow of the moon will fall upon the earth. On the other ſide, the moon paſſes (in the aforeſaid caſe) through the ſhadow of the earth, and is by that means eclipſed. And the orbit A, *fig.* 1. is ſo moveable on the two joints called nodes, that any perſon may eaſily repreſent the due poſition of the nodes and intermediate ſpaces of the moon's orbit; and thence ſhow when there will or will not be an eclipſe of either luminary, and what the quantity of each will be. While the moon is continuing to move round the earth, the lamp on the centre will ſo illuminate her, that all her phaſes, as new, dichotomized, gibbous, full, waining, &c. will be ſeen juſt as they appear in the heavens. All the ſame phaſes of the earth, as they appear at the moon, will alſo be exhibited. The ſatellites of Jupiter and Saturn are moveable only by the hand; yet all their phænomena may be eaſily repreſented, excepting the true relative motions and diſtances.

(677.) The IMPROVED CELESTIAL GLOBE, is represented in PLATE XXXII. *fig.* 4. on the north pole of the axis, above the hour circle, is fixed an arch MKH of 23½ degrees; and at the end H is fixed an upright pin HG, which stands directly over the north pole of the ecliptic, and perpendicular to that part of the surface of the globe. On this pin are two moveable collets at D and H, to which are fixed the quadrantile wires N and O, having two little balls on their ends for the sun and moon, as in the figure. The collet D is fixed to the circular plate F, whereon the 29½ days of the moon's age are engraven, beginning just under the sun's wire N; and as this wire is moved round the globe, the plate F turns round with it. These wires are easily turned, if the screw G be slackened: and when they are set to their proper places, the screw serves to fix them there, so as in turning the ball of the globe, the wires with the sun and moon go round with it; and these two little balls rise and set at the same times, and on the same points of the horizon, for the day to which they are rectified, as the sun and moon do in the heavens.

(678.) As the moon does not keep her course in the ecliptic, but has a declination of 5½ degrees on each side from it in every lunation, her ball may be screwed as many degrees to either side of the ecliptic as her latitude or declination from the ecliptic amounts to any given time. The horizon is supported by two semicircular arches, because pillars would stop the progress of the balls when they go below the horizon in an oblique sphere. To rectify this globe, elevate the pole to the latitude of the place; then bring the sun's place in the ecliptic for the given day to the brazen meridian, and set the hour index at 12 at noon, that is, to the upper 12 on the hour circle; keeping the globe in that situation, slacken the screw G, and set the sun directly over his place on the meridian; which done, set the moon's wire under the number that expresses her age for that day on the Plate F, and she will then stand over her place in the ecliptic, and show what constellation she is in. Lastly, fasten the screw G, and adjust the moon to her latitude, and the globe will be rectified.

(679.) The TRAJECTORIUM LUNARE, *fig.* 5. is intended, by delineating the paths of the earth and moon, to show what sort of curves they make in the ethereal regions. S is the sun, and E the earth, whose centres are 95 inches distant from each other; every inch answering to 1,000,000 of miles. M is the moon, whose centre is $\frac{3}{100}$ parts of an inch from the earth's in this machine, this being in just proportion to the moon's distance from the earth. AA is a bar of wood, to be moved by hand round the axis *g*, which is fixed in the wheel Y. The circumference of this wheel is to the circumference of the small wheel L, (below the other end of the bar) as 365¼ days to 29½, or as a year is to a lunation. The wheels are grooved round their edges, and in the grooves is the catgut string GG crossing between the wheels at X. On the axis of the wheel L is the index F, in which is fixed the moon's axis M for carrying her round the earth E fixed on the axis of the wheel L in the time that the index goes round a circle of 29½ equal parts, which are the days of the moon's age. The wheel Y has the months and days of the year all around its limb; and in the bar AA is fixed the index *l*, which points out the days of the months answering the days of the moon's age, shown by the index, F, in the circle of 29½ equal parts at the other end of the bar. On the axis of the wheel is put the piece D, below the cock C, in which this axis turns round, and in D are put the pencils *e* and *m* directly under the earth C and moon M; so that *m* is carried round *e* as M is round E.

(680.) Lay the machine on an even floor, pressing gently on the wheel Y, to cause its three feet (of which two appear at P, the third being supposed to be hid from the sight by the wheel) enter a little into the floor to secure the wheel from turning. Then lay a paper about 4 feet long under the pencils *e* and *m*, crosswise to the bar; which done, move the bar slowly round the axis *g* of the wheel Y; and as the earth E goes round the Sun S, the moon M will go round the earth with a duly proportioned velocity; and the motion wheel W, running on the floor, will keep the bar from bearing too heavily on the pencils *e* and *m*, which will delineate the paths of the earth and moon. As the index I points out the days of the months, the index F shows the moon's age in these days, in the circle of 29½ equal parts. And as this last index points to the different days in its circle, the like numeral figures may be set to those parts of the curves of the earth's path and moon's, where the pencils *e* and *m* are at those times respectively, to show the places of the earth and moon. If the pencil *e* be pushed a very little off, as if from the pencil *m*, to about $\frac{1}{10}$ part of their distance, and the pencil *m* pushed a little towards *e*, to bring them to the same distance again, though not to the same points of the bar; then, *m* goes round *e*, *e* will go as it were round the centre of gravity between the earth and moon *m*; but this motion will not sensibly affect the figure of the earth's path or the moon's.

(681.) If a pin, as *p* be put through the paper *m*, with its head towards that of the pin *q* in the pencil *e*, its head will always keep therein as it goes round *e*, or as the same side of the moon is still obverted to the earth. But the pin *p*, which may be considered as an equatorial diameter of the moon, will turn quite round the point *q*, making all possible angles with the line of its progress, or line of the moon's path. This is an ocular proof of the moon's turning round its axis.

SECT. II. *Of the* PRINCIPAL INSTRUMENTS *for* MAKING ASTRONOMICAL OBSERVATIONS.

(682.) In practical astronomy it is necessary to have a place conveniently situated, and properly furnished with proper astronomical instruments. It should have an uninterrupted view from the zenith down to, or even below, the horizon, at least towards its cardinal points. For this purpose that part of the roof which lies in the direction of the meridian in particular, should have moveable covers, which may easily be moved off or put on again; by which means an instrument may be directed to any point of the heavens between

with one of the divisions of the limb, in like manner in moving two 20ths, or 30″, we must look at the second division of the index, and there will be a coincidence with a division of the limb. Thus the beginning, D, of the vernier, which is always the line of reckoning, has advanced two divisions, or 30″, to the right, when the second division, marked 30 on the vernier, is seen to correspond exactly with one of the lines of the quadrant.

(693.) The plate of copper which carries the telescope, is placed on the side of the quadrant, and carries two verniers. The outer line CD divides five minutes into 20 parts, or 15″ each. The interior line AB answers to the parts of another division not having 90°, but 96 parts of the quadrant. It is usually adopted by English astronomers on account of the facility of its subdivisions. Each of the 96 portions of the quadrant is equivalent to 56′ 15″ of the usual divisions. It is divided on the limb into 16 parts, and the arch of the vernier AB contains 25 of these divisions; and being divided itself into 24, immediately give parts, the value of each of which is 8″ 47½‴.

(694.) VI. The PORTABLE ASTRONOMICAL QUADRANT is generally made from 12 to 23 inches. *Fig.* 3. *Plate* XXXIV, represents one of brass, and strongly framed together by crossed perpendicular bars. The arch AC, and telescope EF are divided and constructed in a similar manner to the mural quadrant, but generally without the division of 96 parts. The counterpoise to the telescope T is represented at P, and also another counterpoise to the quadrant itself at P. The quadrant is fixed to a long axis, which goes into the pillar KR. Upon this axis is fixed an index, which points to, and subdivides by a vernier, the divisions of the azimuth circle, K. This azimuth circle is extremely useful for taking the azimuth of a celestial body, at the time its altitude is observed. The upper end of the axis is firmly connected with the adjusting frame GH; and the pillar is supported on the crossed feet at the bottom of the pillar KR with the adjusting screws *a*, *b*, *c*, *d*.

(695.) When the instrument is erected for observation, it is necessary that two adjustments be very accurately made: one, that the place or surface of the instrument be truly perpendicular to the horizon; the other, that the line supposed to be drawn from the centre to the first line of the limb, be truly on a level or parallel with the horizon. The first of these particulars is done by means of the thread and plummet *p*; the thread of which is usually of very fine silver wire, and it is placed opposite to a mark made upon the end of the limb of the instrument. The four screws at the foot *a*, *b*, *c*, *d*, are to be turned until a perfect coincidence is observed of the thread upon the mark, which is accurately observed by means of a small telescope T, that fits to the limb. The other adjustment is effected by means of the spirit level L, which applies on the frame GH, and the small screws turned as before until the bubble of air in the level settles in the middle of the tube. The dotted tube EB is a kind of prover to the instrument: for by observing at what mark the centre of it appears against, or by putting up a mark against it, it will at any time discover if the instrument has been displaced. The screw S at the index, is the regulating or adjusting screw, to move the telescope and index, during the observation, with the utmost nicety.

(696.) VII. The ASTRONOMICAL *or* EQUATORIAL SECTOR, is an instrument for finding the difference, in right ascension and declination, between two objects; the distance of which is too great to be observed by the micrometer, and was invented by Graham. Let AB, *Plate* XXXIV, *fig.* 4. represent an arch of a circle containing 10 or 12 degrees well divided, having a strong plate CD for its radius, fixed to the middle of the arch at D: let this radius be applied to the side of an axis HFI, and be moveable about a joint fixed to it at F, so that the plane of the sector may be always parallel to the axis HI; which being parallel to the axis of the earth, the plane of the sector will always be parallel to the plane of some hour circle. Let a telescope CE be moveable about the centre C of the arch AB, from one end of it to the other, by turning a screw at G; and let the line of sight be parallel to the plane of the sector. Now, by turning the whole instrument about the axis HI, till the plane of it be successively directed, first to one of the stars and then to another, it is easy to move the sector about the joint F, into such a position, that the arch AB, when fixed, shall take in both the stars in their passage, by the plane of it, provided the difference of their declinations does not exceed the arch AB. Then, having fixed the plane of the sector a little to the westward of both the stars, move the telescope CE by the screw G; and observe by a clock the time of each transit over the cross hairs, and also the degree and minutes upon the arch AB, or by the index at each transit; then in the difference of the arches, the difference of the declinations, and by the difference of the times, we have the difference of the right ascensions of the stars.

(697.) The dimensions of this instrument are these: The length of the telescope, or the radius of the sector, is 2½ feet; the breadth of the radius, near the end C, is 1½ inch; and at the end D, 2 inches. The breadth of the limb, AB, is 1½ inch; and its length, 6 inches, containing 10 degrees, divided into quarters, and numbered from either end to the other. The telescope carries a nonius or subdividing plate, whose length, being equal to 16 quarters of a degree, is divided into 15 equal parts; which, in effect, divides the limb into minutes, and, by estimation, into smaller parts. The length of the square axis, HIF, is 18 inches, and of the part HI, 12 inches; and its thickness is about a quarter of an inch: the diameters of the circles are each 5 inches: the thickness of the plates, and the other measures, may be taken at the direction of a workman.

(698.) This instrument may be rectified, for making observations, in this manner: By placing the intersection of the cross hairs, at the same distance from the plane of the sector, as the centre of the object-glass, the plane described by the line of sight, during the circular motion of the telescope upon the limb, will be sufficiently true and free from conical curvity; which may be examined, by suspending a long plumb-line at a convenient distance from the instrument; and, by bringing the plane of the sector in a vertical position, &c.

id then by obſerving, while the teleſcope is mo-
d by the ſcrew along the limb, whether the
oſs hairs appear to move along the plumb line.
(699.) The axis, *b f o*, may be elevated, nearly
rallel to the axis of the earth, by means of a
all common quadrant; and its error may be
rrected, by making the line of ſight follow the
rcular motion of any of the circumpolar ſtars,
hile the whole inſtrument is moved about its
is, *b f o*, the teleſcope being fixed to the limb;
r this purpoſe, let the teleſcope *k l* be directed
the ſtar *a*, when it paſſes over the higheſt point
f its diurnal circle, and let the diviſion cut by
ie nonius be then noted: then, after 12 hours,
hen the ſtar comes to the loweſt point of its
rcle, having turned the inſtrument half round
s axis, to bring the teleſcope into the poſitio
n *m n*; if the croſs hairs cover the ſame ſtar
ppoſed at *b*, the elevation of the axis, *b f o*, is
xactly right; but, if it be neceſſary to move the
eleſcope into the poſition *u v*, in order to point
the ſtar at *c*, the arch *m u*, which meaſures the
ngle *m f u* or *b f c*, will be known; and then
he axis *b f o* muſt be depreſſed half the quantity
f this given angle, if the ſtar paſſed below *b*, or
muſt be raiſed ſo much higher, if above it; and
hen the trial muſt be repeated, till the true ele-
ation of the axis be obtained. By making the
ike obſervations upon the ſame ſtar on each ſide
he pole, in the ſix o'clock hour-circle, the error
of the axis, toward the eaſt or weſt, may alſo be
ound and corrected, till the croſs hairs follow
he ſtar quite round the pole: for, ſuppoſing *a o*
b c to be an arch of the meridian, (or in the ſe-
condary practice of the ſix o'clock hour-circle),
make the angle *a f p* equal to half an angle *a f c*,
nd the line *f p* will point to the pole; and the
ngle *o f p*, which is the error of the axis, will be
equal to half the angle *b f c*, or *m f u*, found by
the obſervation; becauſe, the difference of the two
angles *a f b*, *a f c*, is double the difference of their
halves *a f o* and *a f p*. Unleſs the ſtar be near the
pole, allowance muſt be made for refractions.

(700.) VIII. The TRANSIT INSTRUMENT is uſed for obſerving objects as they paſs over the meridian, and conſiſts of a teleſcope fixed at right angles to an horizontal axis, ſo ſupported that what is called the line of collimation, or line of ſight of the teleſcope, may move in the plane of the meridian. The axis, AB, PLATE XXXIV. fig. 5. to which the middle of the teleſcope is fixed, is about 2½ feet long, tapering gradually toward its ends, which terminate in cylinders well turned and ſmoothed. The teleſcope CD, which is about four feet and 1½ inch diameter, is connected with the axis by means of a ſtrong cube or die G, and in which the two cones MQ, forming the axis are fixed. This cube or ſtock G ſerves as the principal part of the whole machine. It not only keeps together the two cones, but holds the two ſockets KH, of 15 inches length, for the two teleſcopic tubes. Each of theſe ſockets has a ſquare baſe, and is fixed to the cube by four ſcrews. Theſe ſockets are cut down in the ſides about eight inches, to admit more eaſily the tube of the teleſcope; but when the tube is inſerted, it is kept in firm by ſcrewing up the tightening ſcrews at the end of the ſockets at K and H. Theſe two ſockets are very uſeful in keeping the teleſcope in its greateſt poſſible degree of ſteadineſs. They alſo afford a better opportunity of balancing the teleſcope and rectifying its vertical thread, than by any other means.

(701.) To direct the teleſcope to the given height, that a ſtar would be obſerved at, there is fixed a ſemicircle AN on one of the ſupporters, of about 8½ inches diameter, and divided into degrees. The index is fixed on the axis, at the end of which is a vernier, which ſubdivides the degrees into 12 parts or five minutes. This index is moveable on the axis, and may be cloſely applied to the diviſions by means of a tightening ſcrew. Two upright poſts of wood or ſtone YY, firmly fixed at a proper diſtance, ſuſtain the ſupporters of this inſtrument. Theſe ſupporters are two thick braſs plates RR, having well ſmoothed angular notches in their upper ends, to receive the cylindrical arms of the axis. Each of theſe notched plates is contrived to be moveable by a ſcrew, which ſlides them upon the ſurfaces of two other plates, immoveably fixed upon the two upright pillars; one plate moving in an horizontal, and the other in a vertical direction; or which is more ſimple, theſe two modes are ſometimes applied only on one ſide, as at N and P, the horizontal motion by the ſcrew P, and the vertical by the ſcrew V.

(702.) Theſe two motions ſerve to adjuſt the teleſcope to the planes of the horizon and meridian; to the plane of the horizon by the ſpirit level EF, hung by DC on the axis MQ, in a parallel direction; and to the plane of the meridian in the following manner: Obſerve by the clock when a circumpolar ſtar ſeen through this inſtrument tranſits both above and below the pole; and if the times of deſcribing the eaſtern and weſtern parts of its circuit are equal, the teleſcope is then in the plane of the meridian: otherwiſe the ſcrew P muſt be gently turned that it may move the teleſcope ſo much that the time of the ſtars revolution be biſected by both the upper and lower tranſits, taking care at the ſame time that the axis remain perfectly horizontal.

(703.) When the teleſcope is thus adjuſted, a mark muſt be ſet at a conſiderable diſtance, (the greater the better) in the horizontal direction of the interſection of the croſs wires, and in a place where it can be illuminated in the night by a lanthorn hanging near it; which mark being on a fixed object, will ſerve at all times afterwards to examine the poſition of the teleſcope by, the axis of the inſtrument being firſt adjuſted by means of the level.

(704.) IX. The EQUATORIAL or PORTABLE OBSERVATORY; an inſtrument deſigned to anſwer a number of uſeful purpoſes in practical aſtronomy, independent of any particular obſervatory, may be made uſe of in any ſteady place, and performs moſt of the uſeful operations in the ſcience. The principal parts of this inſtrument, PLATE XXXIV. fig. 6. are, 1. The azimuth or horizontal circle A, which repreſents the horizon of the place, and moves on a long axis B, called the *vertical axis*. 2. The equatorial or hour circle C, repreſenting the equator, placed at right angles to the polar axis D, or the axis of the

earth.

earth upon which it moves. 3. The ſemicircle of declination E, on which the teleſcope is placed, and moving on the axis of declination, or the axis of motion of the line of collimation.

(705.) Theſe circles are meaſured and divided as in the following table:

Meaſures of the ſeveral circles, and diviſions of them.	Radius. In dec.	Limb divided to	Nonius of 30 given ſeconds.	Divided on limb into parts of inc.	Divided by Nonius into parts of inc.
Azimuth or horizontal circle.	5 1	15′	30″	45th	1350th
Equatorial or hour circle.	5 1	15′ / 1′ in time.	30′ / 2″	45th	1350th
Vertical ſemicircle for declination or latitude.	5 5	15′	30″	42d	1260th

(706.) 4. The teleſcope in this equatorial may be brought parallel to the polar axis, as in the figure, ſo as to point to the pole ſtar in any part of its diurnal revolution: and thus it has been obſerved near noon, when the ſun has ſhone very bright. 5. The apparatus for correcting the error in altitude occaſioned by refraction, which is applied to the eye end of the teleſcope, and conſiſts of a ſlide G, moving in a groove or dovetail, and carrying the ſeveral eye tubes of the teleſcope, on which ſlide there is an index correſponding to five ſmall diviſions engraved on the dovetail; a very ſmall circle, called the refraction circle, H, moveable by a finger ſcrew at the extremity of the eye end of the teleſcope; which circle is divided into half minutes, one entire revolution of it being equal to 3′ 18″, and by its motion raiſes the centre of the croſs hairs on a circle of altitude; and a quadrant, I, of 1¼ inch radius, with diviſions on each ſide, one expreſſing the degree of altitude of the object viewed, and the other expreſſing the minutes and ſeconds of error occaſioned by refraction correſponding to that degree of altitude: To this quadrant is joined a ſmall round level, K, which is adjuſted partly by the pinion that turns the whole of this apparatus, and partly by the index of the quadrant; for which purpoſe the refraction circle is ſet to the ſame minute, &c. which the index points to, on the limb of the quadrant; and if the minute, &c. given by the quadrant exceed the 3′ 18″, contained in one entire revolution of the refraction circle, this muſt be ſet to the exceſs above one or more of its entire revolutions; then the centre of the croſs hairs will appear to be raiſed on a circle of altitude to the additional height which the error of refraction will occaſion at that altitude.

(707.) To adjuſt this inſtrument make the line of collimation to deſcribe a portion of an hour circle in the heavens; in order to which the azimuth circle muſt be truly level, the line of collimation or ſome correſponding line repreſented by the ſmall braſs rod, M, parallel to it, muſt be perpendicular to the axis of its own proper motion; and this laſt axis muſt be perpendicular to the polar axis; on the braſs rod, M, there is occaſionally placed a hanging level, N, the uſe of which will appear in the following adjuſtments:

(708.) The azimuth circle may be made level, by turning the inſtrument till one of the levels is parallel to an imaginary line joining two of the feet ſcrews; then adjuſt the level with their feet ſcrews; turn the circle half round, i.e. and if the bubble be not then right, correct the error by the ſcrew belonging to the level, the other half error by the two feet ſcrews; repeat this till the bubble comes right; then the circle 90° from the two former poſitions, ſet the bubble right, if it be wrong, by the ſcrew at the end of the level; when this is adjuſt the other level by its own ſcrew, the azimuth circle will be truly level. The hanging level muſt then be fixed to the brass by two hooks of equal length, and made parallel to it: for this purpoſe make the polar perpendicular or nearly perpendicular to the horizon; then adjuſt the level by the pinion of declination ſemicircle: reverſe the level and, if be wrong, correct half the error by a ſmall ſcrew that lies under one end of the level, and other half error by the pinion of the declination ſemicircle; repeat this till the bubble be right both poſitions.

(709.) To make the braſs rod on which the level is ſuſpended at right angles to the axis of motion of the teleſcope or line of collimation, and the polar axis horizontal, or nearly ſo: ſet the declination ſemicircle to 0°, turn the hour circle the bubble comes right; then turn the declination circle to 90°; adjuſt the bubble by raiſing or preſſing the polar axis, firſt by hand till it be nearly right; afterwards tighten, with an ivory key, the ſocket which runs on an arch with the polar axis; and then apply the ſame ivory key to the adjuſting ſcrew at the end of the ſaid arch, till the bubble comes quite right; then turn the declination circle to the oppoſite 90°; if the level be not then right, correct half the error, by the aforeſaid adjuſting ſcrew at the end of the arch, and the other half error by the two ſcrews which raiſe or depreſs the end of the braſs rod. The polar axis remaining nearly horizontal as before, and the declination ſemicircle at 0°, adjuſt the bubble by the hour circle; then turn the declination ſemicircle to 90°, and adjuſt the bubble by raiſing or depreſſing the polar axis; then turn the hour circle 12 hours; and if the bubble be wrong, correct half the error by the polar axis, and the other half error by the two parallel ſtan ſcrews at the feet of the two ſupports of the

ide of the axis of motion of the telescope; and hus this axis will be at right angles to the polar axis.

(710.) The next adjustment is to make the centre of cross hairs remain on the same object, while the eye tube is turned quite round by the pinion of the refraction apparatus. For this adjustment, set the index on the slide to the first division on the dovetail; and set the division marked 18″ on the refraction circle to its index; then look through the telescope, and with the pinion turn the eye tube quit round; and if the centre of the hairs does not remain on the same spot during that revolution, it must be corrected by the four small screws, two and two at a time, which will be found upon unscrewing the nearest end of the eye tube that contains the first eye glass; repeat this correction till the centre of the hairs remains on the spot looked at, during an entire revolution.

(711.) To make the line of collimation parallel to the brass rod on which the level hangs, set the polar axis horizontal, and the declination circle to 0°; adjust the level by the polar axis; look through the telescope on some distant horizontal object, covered by the centre of the cross hairs; then invert the telescope, which is done by turning the hour circle half round, and if the centre of the cross hairs does not cover the same object as before, correct half the error by the uppermost and lowermost of the 4 small screws at the eye end of the large tube of the telescope. This correction will give a second object now covered by the centre of the hairs, which must be adopted instead of the first object: then invert the telescope as before; and if the second object be not covered by the centre of the hairs, correct half the error by the same two screws which were used before. This correction will give a third object, now covered by the centre of the hairs, which must be adopted instead of the second object; repeat this operation till no error remains; then set the hour circle exactly to 12 hours (the declination circle remaining at 90° as before); and if the centre of the cross hairs does not cover the last object fixed on, set it to that object by the two remaining small screws at the eye end of the large tube, and then the line of collimation will be parallel to the brass rod.

(712.) For rectifying the nonius of the declination and equatorial circles, lower the telescope as many degrees, minutes, and seconds, below 0°, or Æ, on the declination semicircle as are equal to the complement of the latitude; then elevate the polar axis till the bubble be horizontal, and thus the equatorial circle will be elevated to the co-latitude of the place; set this circle to 6 hours; adjust the level by the pinion of the declination circle; then turn the equatorial circle exactly 12 hours from the last position; and if the level be not right, correct one half of the error by the equatorial circle, and the other half by the declination circle; then turn the equatorial circle back again exactly 12 hours from the last position; and if the level be still wrong, repeat the correction as before till it be right, when turned to either position; that being done, set the nonius of the equatorial circle exactly to 6 hours, and the nonius of the declination circle exactly to 0°. The principal uses of this equatorial are,

(713.) I. To find the meridian by one observation only: for this purpose, elevate the equatorial circle to the co-latitude of the place, and set the declination semicircle to the sun's declination for the day and hour required; then move the azimuth and hour circles both at the same time, either in the same or contrary direction, till the centre of the cross hairs in the telescope exactly covers the centre of the sun. When that is done, the index of the hour circle will give the apparent or solar time at the instant of observation; and thus the time is gained, though the sun be at a distance from the meridian. Then turn the hour circle till the index points precisely at 12 o'clock, and lower the telescope to the horizon, in order to observe some point there in the centre of the glass, and that point is the meridian mark found by one observation only; the best time for this operation is three hours before or three hours after 12 at noon.

(714.) II. To point the telescope on a star, though not on the meridian, in full day light. Having elevated the equatorial circle to the co-latitude of the place, and set the declination semicircle to the star's declination, move the index of the hour circle till it point to the precise time at which the star is then distant from the meridian, found in tables of the right ascension of the stars, and the star will then appear in the glass. Besides these uses peculiar to this instrument, it is also applicable to all the purposes to which the principal astronomical instruments, viz. a transit, a quadrant, and an equal altitude instrument, are applied.

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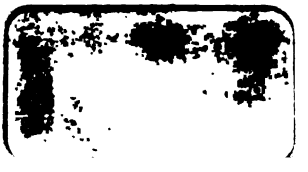
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